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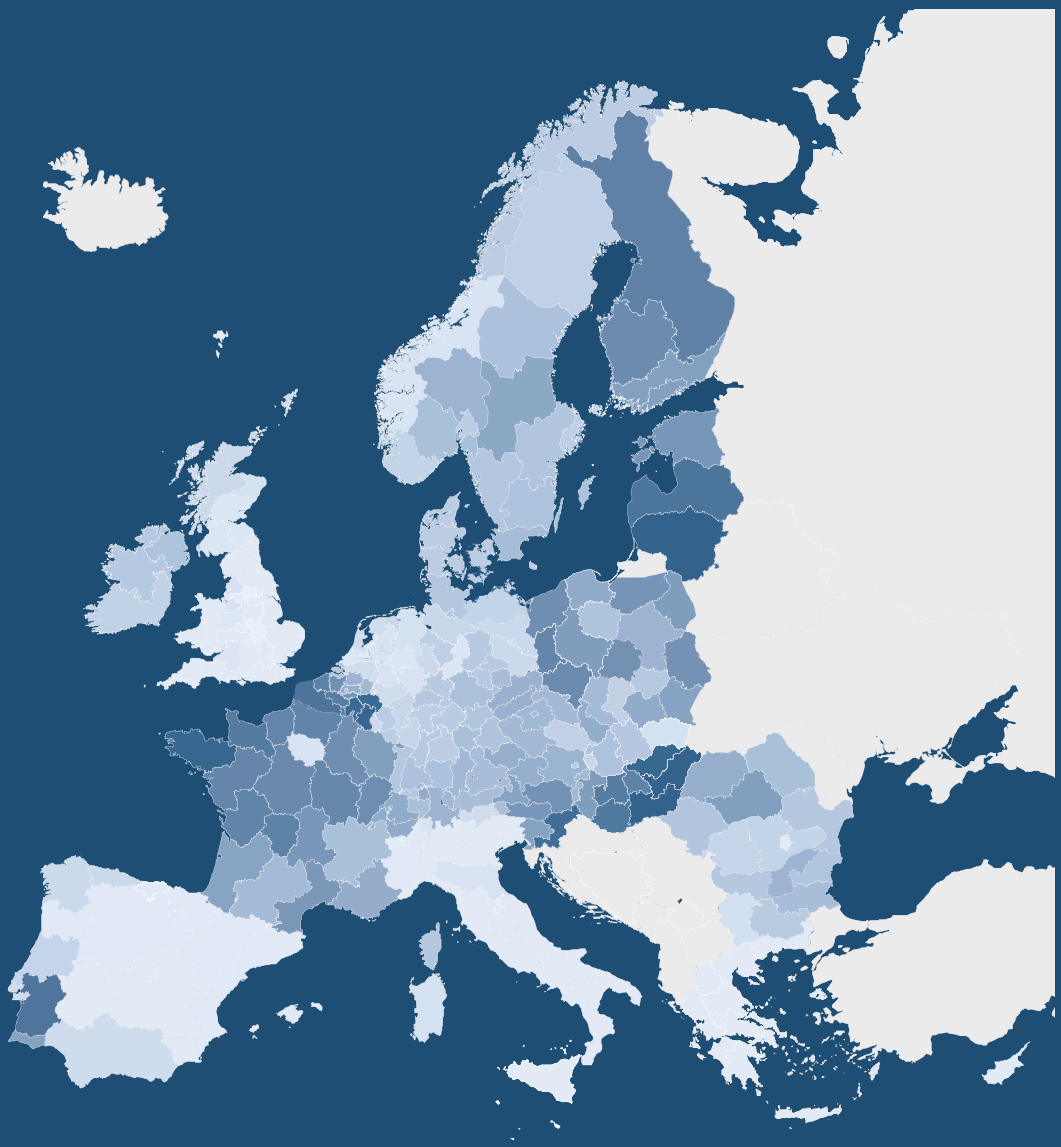
Understanding differences between regional suicide rates

Alexandre Reynders



Thesis submitted in fulfilment of the requirements for the degree of doctor in Biomedical Sciences

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KU Leuven
Biomedical Sciences Group
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UNDERSTANDING DIFFERENCES BETWEEN REGIONAL SUICIDE RATES

Alexandre Reynders

Jury:

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	Prof. Dr. V. Lorant

Thesis presented in fulfilment of the requirements for the degree of Doctor in Biomedical Sciences

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Cover: Visual presentation of standardized suicide rates per 100.000 inhabitants by NUTS 2 region, 3 years average 2008-2010

Datasource: Eurostat retrieved from
http://ec.europa.eu/eurostat/web/regions/data/database (2015, October 19)
Map Design: Frederik Nicolaï

VOORWOORD

Het is intussen ongeveer tien jaar geleden, toen ik werkte bij het Centrum ter Preventie van Zelfdoding, dat ik mij de vraag stelde: Hoe komt het dat de suïcidecijfers in Vlaanderen zoveel hoger liggen dan in Nederland?'. Velen rondom mij vonden dit een fascinerende vraag en de hypotheses lieten niet lang op zich wachten. 'Nederlanders zijn assertiever en praten makkelijker over gevoelige zaken' of; 'Vlamingen staan verder in het registreren van doodsoorzaken, waardoor het lijkt alsof wij hogere suïcidecijfers hebben', etc. Als socioloog bleef deze vraag hangen en ik verlangde ernaar om een wetenschappelijk antwoord te vinden. Van mijn toenmalige directrice, Grieke Forceville, mocht ik een onderzoek opstarten, tenminste als ik er de nodige middelen voor kon vinden. En dus ging ik op zoek naar financiële steun. Die kreeg ik van de Vlaamse Overheid en een stichting die verder anoniem wenst te blijven. Later zou ook het Fonds 'Ga voor Geluk' het project financieel steunen. Het was mijn broer, Michaël, die het idee opperde om er een doctoraat aan te koppelen. Via Gert Scheerder, die bij LUCAS werkte, klopte ik aan bij Prof. Dr. Chantal van Audenhove. Zij geloofde in dit onderzoeksproject en was bereid om mij als promotor te begeleiden. Enige tijd daarna verliet ik het CPZ om als bursaalstudent bij LUCAS aan de slag te gaan. In de tussentijd ging mijn leven verder. Samen met mijn vriendin Ellen kregen we onze eerste dochter Jackie. Gelijktijdig werd ons huis stevig gerenoveerd. De algehele situatie maakte dat ik er niet in slaagde mijn doctoraat netjes binnen de vier jaar af te werken. Ik begon intussen een nieuwe professionele uitdaging bij het Hoger Instituut voor Gezinswetenschappen aan de Odisee Hogeschool. En nog wat later werd onze tweede dochter Jacoba geboren. Al die tijd evolueerde dit doctoraat verder tot het resultaat dat nu voor u ligt.

Dit doctoraat zou er nooit geweest zijn zonder de steun van velen. Allereerst wil ik mijn promotor Prof. Dr. Chantal van Audenhove bedanken. Zij gaf mij het vertrouwen en de kans om binnen LUCAS het onderzoek in Vlaanderen en Nederland op te starten. Ik kon hierbij terugvallen op haar expertise en haar netwerk. Mijn co-promotor Prof. Dr. Geert Molenberghs heeft mij in eerste instantie op methodologisch vlak ondersteund. Daarnaast ben ik hem ook dankbaar voor zijn 'out of the box' denken. Op deze manier zette hij mij aan om mijn grenzen te verleggen. Verder wil ik mijn commissieleden Prof. Dr. Ella Arensman, Prof. Dr. Laurence Claes, Prof. Dr. Stephan Claes, Prof. Dr. Ulrich Hegerl en Prof. Dr. Vincent Lorant bedanken voor het kritisch nalezen van mijn thesis. Het staat buiten kijf dat hun feedback en suggesties mijn doctoraat een laatste keer tot een hoger niveau hebben getild. Prof. Dr. Philip Moons wil ik bedanken als voorzitter van het doctoraal comité en Prof. Dr. Geert Verbeke als voorzitter van mijn publieke verdediging. Tenslotte wil Ik een bijzondere dank uitbrengen aan Prof. Dr. Ad Kerkhof en zijn team van de V.U. Amsterdam. Zowel praktisch, inhoudelijk als mentaal heb ik veel steun mogen ontvangen.

Tijdens mijn jaren als junior onderzoeker op LUCAS heb ik heel wat fijne en boeiende collega's leren kennen. Het was zeer prettig om elkaars projecten te leren kennen en om hierover te reflecteren. Ik herinner mij de steun en de empathie wanneer het soms wat moeilijker ging.

Maar het was uiteraard ook veel meer dan dat. Vaak hebben we onder de middag tot tranen toe gelachen of verbeten pingpongtornooien gespeeld. Onder hen wil ik er twee in het bijzonder bedanken. Gert Scheerder die mij geïntroduceerd heeft bij LUCAS en met wie ik vaak ideeën heb uitgewisseld. Evelien Coppens, één van mijn grappigste vriendinnen.

Mijn professionele carrière ben ik begonnen op het Centrum ter Preventie van Zelfdoding. Initieel waren Grieke en Leen mijn twee enige vaste collega's. We waren drie jonge geëngageerde medewerkers die hun schouders zetten onder een vzw die moest vechten voor haar bestaansrecht. En met succes. Nu, bijna 14 jaar later, zijn we ieder onze eigen professionele weg uitgegaan. Maar ik ben blij dat ik kan zeggen dat jullie nog steeds twee fantastische vriendinnen zijn die mij zeer nauw aan het hart liggen. Lachen en genieten van het leven, hart luchten en zeuren, … en dan terug weer lachen en genieten. Schol!

Nog steeds op het Centrum ter Preventie van Zelfdoding ben ik een bijzondere groep mensen tegengekomen: de vrijwilligers van de Zelfmoordlijn. Ik herinner me jullie als intelligente, goedlachse en geëngageerde mensen met het hart op de juiste plaats. Jullie hebben mij steeds geïnspireerd.

Vandaag werk ik aan de Odisee Hogeschool bij het Hoger Instituut voor Gezinswetenschappen. Ook hier heb ik alweer het genoegen om samen te werken met fijne en boeiende mensen. En al is niet iedereen even goed op de hoogte van het doctoraat waar ik achter de schermen aan verder gewerkt heb, toch haal ik steun uit de persoonlijke contacten en fijne sfeer op onze campus. Ik wil mijn directrice Tanja Nuelant in het bijzonder bedanken. Ik ken je als een warm en attent persoon die veel vertrouwen heeft in haar medewerkers.

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Mijn oude studiegenoten en vrienden sinds bijna de helft van mijn leven, An, Els en Toon zijn steeds een bron van nieuwe inzichten en inspiratie geweest. Als begaafd wetenschapper heeft Toon mij ook geholpen met één van de studies in dit doctoraat. Ook jullie zou ik graag vaker willen zien maar getalenteerde en ambitieuze mensen zijn helaas vaak druk bezet of houden er van om andere oorden te ontdekken.

Mijn lieve ouders, ik wil jullie bedanken omdat jullie me steeds gesteund hebben in de dingen die ik belangrijk vind, ook al was dat niet steeds wat jullie gehoopt hadden. Dit siert jullie. Ik hoop dat ik dit ook steeds kan opbrengen voor mijn eigen dochters. Ik weet dat jullie fier op mij zijn en dat ik steeds op jullie kan rekenen. Dat doet zoveel deugd. Aan mijn grote broer Michaël waar ik naar op kijk, wat ben ik blij dat jij degene bent die voor mij door het vuur zou gaan.

Dankzij Ellen heb ik een mooie schoonfamilie in mijn hart mogen sluiten. Maria en Gilbert, jullie zorgen en steun zijn van onschatbare waarde. Het maakt mij verdrietig, Gilbert, dat ik je niet in de zaal zal zien tijdens mijn verdediging. Maar ik zal aan je denken en jij ook aan mij, dat weet ik gewoon.

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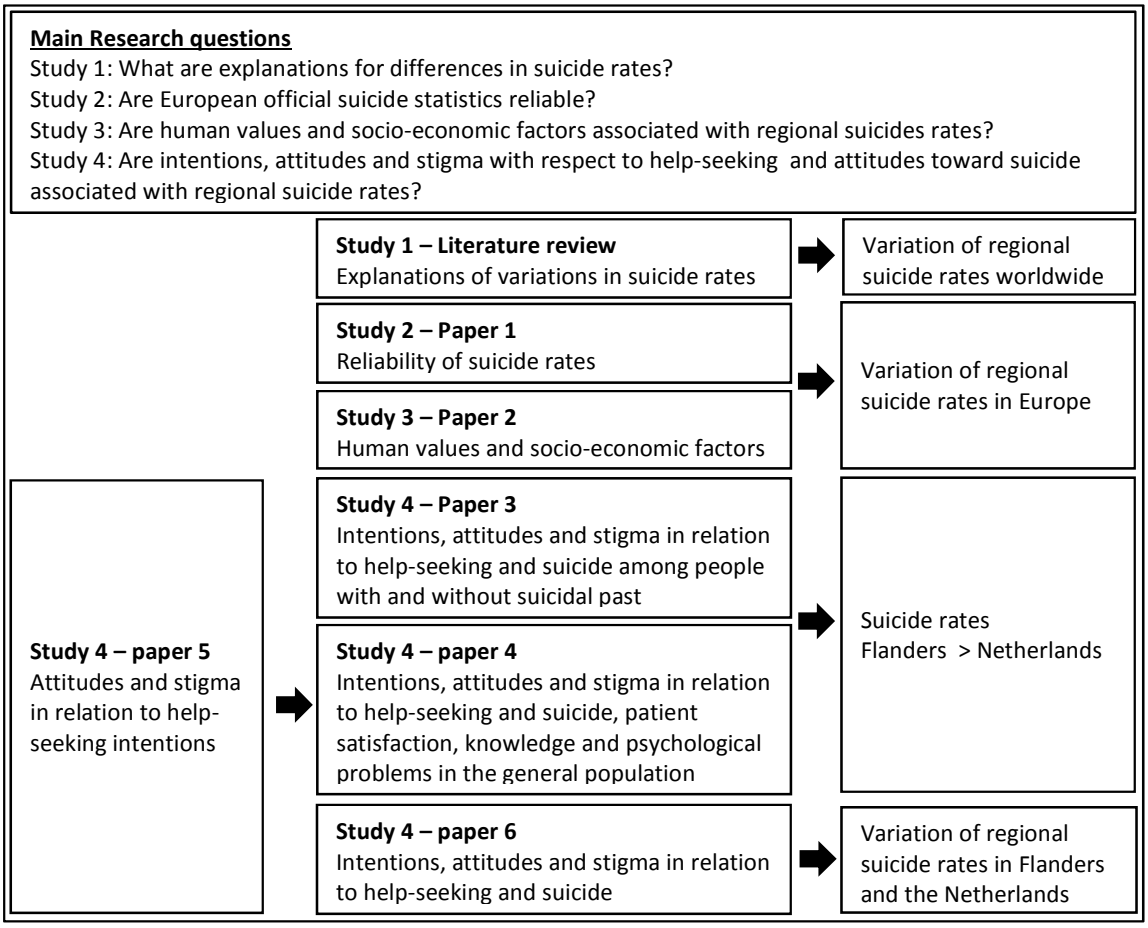
Abstract

Suicide is worldwide one of the most important external causes of death. Nevertheless, suicide rates differ substantially between as well as within countries. This observation suggests that, although seemingly an individual act, suicide is also determined by contextual factors. The aim of this thesis is to improve our understanding of the factors that predict differences between regional suicide rates. The figure below gives an overview of the research questions and studies of this thesis.



The first research question is: What are explanations for differences in suicide rates? In answering this research question, we conducted a literature study. The literature study pointed out that, in general, official suicide rates underestimate the real number of suicides. The degree of underestimation differs between countries, raising questions about the reliability and usefulness of suicide rates for cross-national research. Furthermore, the literature study showed that on an aggregated level, suicide rates were associated with numerous factors. In summary, we can conclude that higher regional suicide rates were associated with higher levels of deprivation and unemployment, lower levels of educational attainment, higher divorce rates, lower fertility rates, higher proportions of elderly and lower levels of social capital. Besides these indicators of social and economic integration, some evidence was found for the Finno-Ugrain hypothesis, suggesting a genetic vulnerability in

relation to suicide. Although an important determinant of suicide on an individual level, the prevalence of psychological problems, with the exception of alcohol abuse, was not found to be a good predictor of suicide rates. The association between the availability of (mental) health care and suicide rates was unclear. However, some studies found that a higher number of antidepressant prescriptions, especially for SSRI's, was associated with lower suicide rates. In addition, evidence for an association between suicide rates and mental health care policies was weak, with the exception of a preventive effect of alcohol abuse prevention policies. Furthermore, rural-urban studies stressed the importance of culture, attitudes, stigma and help-seeking intentions in understanding suicide rates. Nevertheless, empirical evidence on this topic is lacking. These findings form the basis for the three following research questions.

The second research question is (Study 2 - paper 1): Are European official suicide statistics reliable? This was investigated by comparing two sources of railway suicide data in 15 European countries. The first source was the European Railway Association (ERA), that collects data from national railway organizations. The second source were the official national causes of death statistics. The main conclusions of this study were 1) that for seven countries official statistics indicate significantly lower suicide rates than the ERA statistics and 2) that these underestimations differ remarkably between countries. In the case of Flanders and the Netherlands the limited degree of underestimation was similar.

The third research question is (Study 3 - paper 2): Are Schwartz' human values associated with suicide rates? In this longitudinal study we collected data on socio-economic factors and suicide rates from the European Social Survey and Eurostat for 107 NUTS 2 - regions of 11 European countries. Here, the main conclusion is that the human value dimension 'Autonomy vs. Embeddedness' was the single consistent predictor of regional suicide rates. In regions where people gave more priority to values reflecting autonomy, suicide rates were lower in the years following.

The fourth research question is (Study 4 - paper 3-6): Are intentions, attitudes and stigma with respect to help-seeking and attitudes toward suicide associated with regional suicide rates? We conducted a study among the general population between 18 and 65 years old in Flanders and the Netherlands. Despite differences in for example culture and the organization of health care, both regions exhibit similarities with respect to economic, demographic and geographic factors. Nevertheless, compared to the Netherlands, suicide rates are 80% higher in Flanders. The results in Paper 3 showed that, compared to people without a suicidal past, people with a suicidal past are less likely to seek professional and informal help, perceive more stigma, experience more self-stigma (only men) and shame (only women) when seeking help and have more accepting attitudes toward suicide. In comparison to their Dutch counterparts, Flemish people with a suicidal past less often had positive attitudes toward help-seeking, they had less intentions to seek professional and informal (only women) help and they less often had received help for psychological problems (only men).

In Paper 4, we found that the incidence of psychological problems and suicidal ideation and behavior did not differ significantly between Flanders and the Netherlands. Compared to Flemish people, more Dutch people who had psychological problems, received psychological help and they more often had the intention to seek help in the future. Furthermore, knowledge of mental health care was better and patient satisfaction was higher in the Netherlands. In the Netherlands, more people had more accepting attitudes toward suicide than in Flanders.

The results of Paper 5 indicated that people in the Netherlands have more positive attitudes toward help seeking and experience less self-stigma and shame compared to the people in Flanders. These attitudinal factors predicted professional as well as informal help seeking intentions. Perceived stigma was negatively associated with informal help seeking. Shame was positively associated with a higher intention to use psychotropic drugs and perceived stigma was negatively associated with the intention to seek help from a psychotherapist in Flanders but not in the Netherlands.

Finally, in Paper 6 we found that lower regional suicide rates in Flanders and the Netherlands were significantly associated with higher regional averages of the intention to seek informal help, and lower levels of self-stigmatiation and shame.

The main limitation of our cross-national studie is that the analysis on a agregated level does not allow us to draw conslusions with respect to the causality between independent variables and suicide rates, nor does it allow us to draw conclusions on an individual level.

In conclusion, we can state that suicide rates are often underestimated and that de degree of reliability differs remarkably between European countries. Therefore, caution is needed when comparing official suicide rates. However, we also found that the suicide rates of Flanders and the Netherlands seem to be equally reliable. Next, although the literature study showed that socio-economic factors are often found to be predictors of national suicide rates, we found that the human value 'Autonomy vs. Embeddedness' was the strongest predictor of European regional suicide rates. When focusing on Flanders and the Netherlands only, we found no differences between the two regions with respect to risk factors such as mental well-being and a history of suicidal ideation and behavior. However, compared to Flemish people, Dutch people were more often characterized by protective factors related to psychological help-seeking. Moreover, more informal help-seeking intentions, and lower levels of self-stigma and shame were associated with lower regional suicide rates in Flanders and the Netherlands.

Based on our findings, we recommend the standardization of certification and registration procedures to assess causes of death. Furthermore, our studies show that human values, informal networks, and attitudinal factors in relation to psychological help-seeking are associated with suicide rates. This should be taken into account when developing suicide prevention policies.

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Introduction

Suicide is the most important external cause of death in the majority of countries worldwide, and thus a severe but preventable health problem (Nock et al, 2008). Furthermore, suicide rates can vary strongly between and even within countries. Although suicide seems to be an individual act, these regional variations suggest that also contextual factors play a significant role. Researchers, care takers and policy makers seek to gain a better understanding of the factors that determine the differences between regional suicide rates. Therefore, Study 1 of this Thesis is a literature study on the explanations of differences between suicide rates. We will discuss the current insights and the main shortcomings in this domain. Based on Study 1, we will show that, despite the extensive body of studies on this topic, some aspects received little attention. These findings are the basis for the three following studies presented in the Studies 2 - 4.

The first subject under investigation and presented in Study 2, is the reliability of official suicide rates. Suicide statistics in themselves do not determine the incidence of suicide. Nevertheless, these statistics are the most important and most used indicators of the actual number of suicides. However, researchers expressed their doubt about the reliability of these statistics. Studies based on unreliable suicide data could lead to biased results and ditto conclusions. Therefore, in Study 2 we will compare the suicide statistics from two databases in 15 European countries.

Study 3 addresses the observation that in the current scientific literature, the role of culture on the incidence of suicide remains underexposed. Despite various scholars recognize the relevance of the cultural context in understanding suicide, the systematic study of these cultural factors is still in an embryonic phase (Colucci, 2013). Therefore, we will investigate in Study 3 the association between Schwarz's human values and the suicide rates of 107 regions in 11 European countries.

In Study 4, we focus on help-seeking for psychological problems as an important protective factor of suicide. Receiving adequate help can prevent psychological problems to aggravate and thus decrease the risk of suicide. Although the availability and accessibility of help is necessary, it is not sufficient for people to seek help. Angermeyer et al. (2001) stated that:

> *"(...) economic considerations and the geographical proximity of services may provide only a partial explanation of help-seeking behaviour. The impact of the socio-cultural environment in this regard has been largely neglected. Attitudes, values and belief systems (...) influence the manner in which an individual defines and acts upon symptoms and life crisis." (p. 202).*

And Dervic et al. (2006) pointed out that:

> *"A cross-cultural comparison of predominant attitudes toward suicide and help-seeking behaviour could improve our understanding of the socio-cultural aspects of suicidal phenomena, and add new information that might serve as a basis for each society's prevention strategies (….)." (p. 540).*

These citations suggest that cultural values and, more specifically, attitudinal factors in relation to help-seeking and suicide, can play an important role in understanding differences between regional suicide rates. Nevertheless, empirical evidence for these assumptions is scarce. In Study 4, we will contribute to this line of research by investigating these associations in Flanders and the Netherlands.

In the final section of this Thesis, we will discuss the main findings and the limitations of our studies. Furthermore, we propose policy recommendations and suggestions for future research.

Before introducing the four studies, we will first discuss the scope of the problem addressed in this Thesis in the following paragraphs. Therefore, we present statistics 1) on the epidemiology of suicide and 2) on the regional variations in suicide rates within a European context. In the final paragraph of this introduction, we define the aim of this Thesis together with the four main research questions.

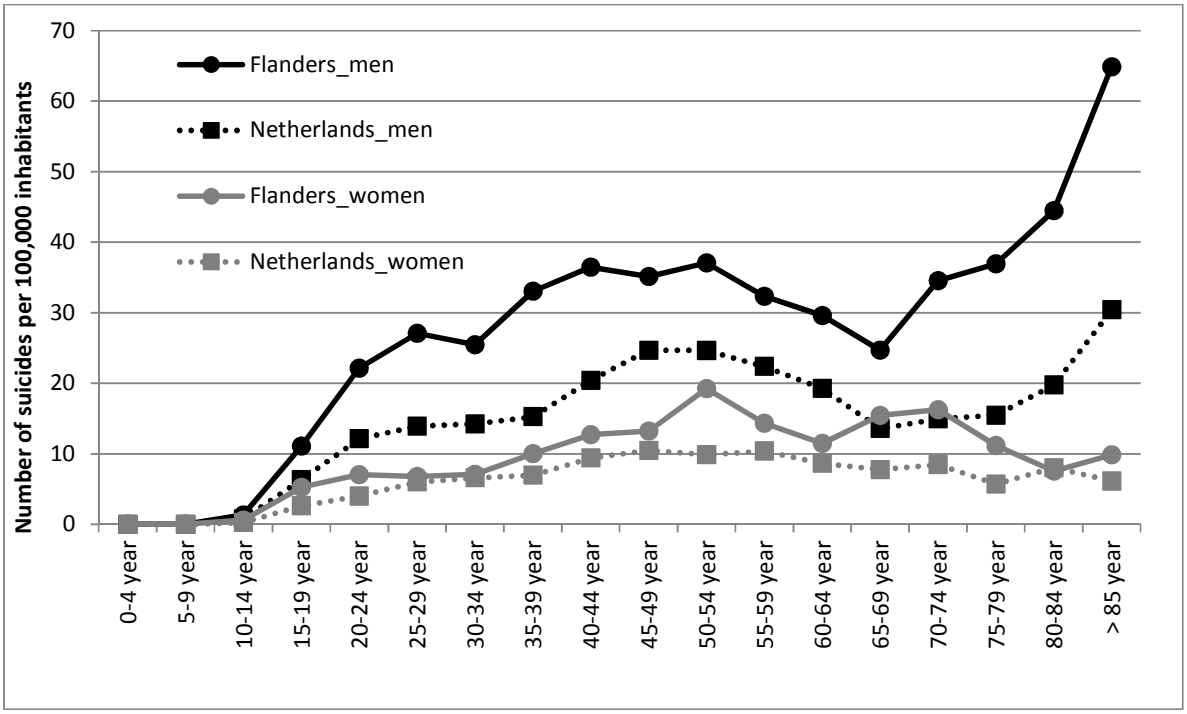
1. The epidemiology of suicide

In this paragraph we describe the demographic distribution of suicide per 100,000 inhabitants and as a proportion of the mortality rate. Next, we present the time trends of suicide since 2000 per 100,000 inhabitants and in terms of years of potential life lost (YPLL). Finally, as it is the central theme of this Thesis, we provide data on inter- and intranational differences between suicide rates within a European context. Where available, will also discuss the data on suicide ideation and suicide attempts.

1.1 Age and gender distribution of suicidal behavior and suicidal ideation

Graph 1 shows that, compared to the Netherlands, Flemish suicide rates are higher for both genders and most age categories. The age distribution is similar for both regions. We notice an increase of the suicide rates together with age, resulting in a peak at the age of 40 till 60 years old, followed by a steady decrease. In the case of men, suicide rates increase again from

the age of 70 to 80 years old. Therefore, suicide rates per 100.000 inhabitants are the highest among older men.

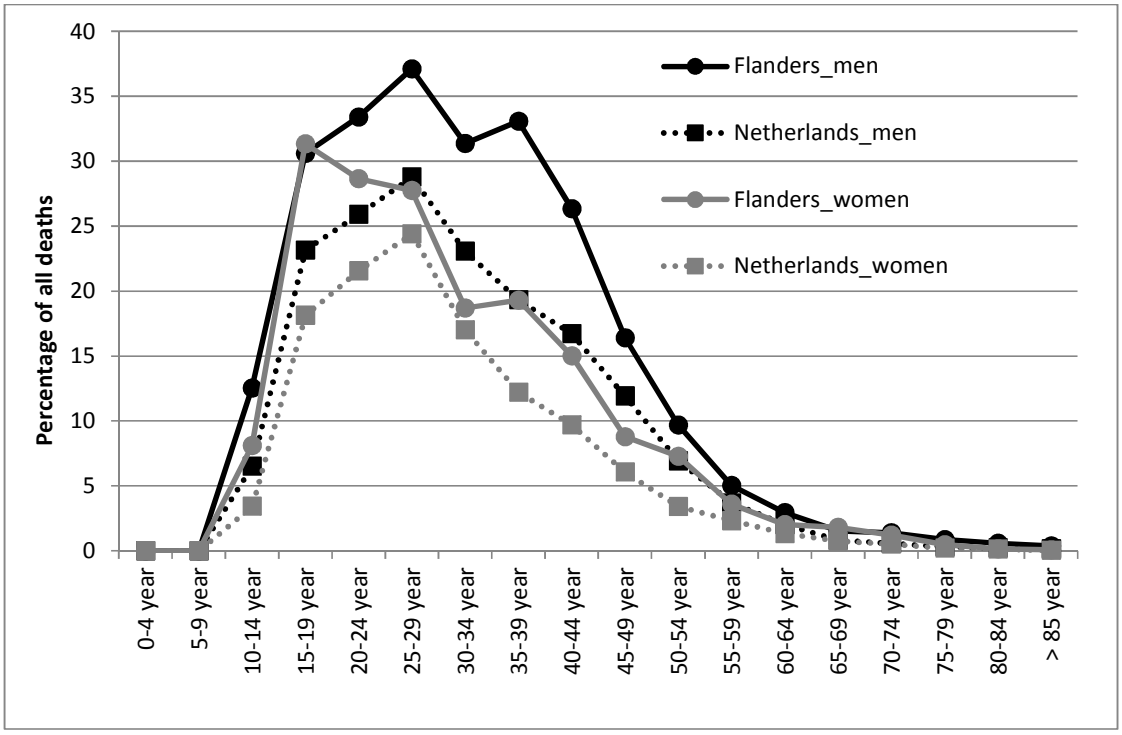


Graph 1 Age distribution of suicide rates per 100,000 inhabitants in Flanders and the Netherlands for men and women. Average for the years 2010-2012.
(Data source: Vlaams Agenschap voor Zorg en Gezondheid and Centraal Bureau voor Statistiek**)**

Expressed in terms of the percentage of the total number of deceased people, we see a different pattern. The proportion of suicides is the highest among people between 15 and 40 years old. Within this age category, one in three deaths among Flemish men is caused by suicide. Moreover, in 2012 suicide is the primary cause of death among Flemish men between 20 and 55 years old and among Flemish women between 10 and 40 years old. After this age, diseases such as cancer and, later on, hart diseases become more important causes of death. Thus, despite suicide rates are the highest among older men, suicide is not a top ten cause of death among the elderly.

According to the Belgian Health Interview Survey (Drieskens et al. 2008-2013), 4.9% of the people have had suicidal thoughts during the past 12 months in 2013. In 2008, this was 2.9%. Furthermore, it was found that about 0.5% attempted suicide during the past 12 months. No significant difference was found between men and women. Furthermore, there is no clear pattern with respect to the age distribution. The Unit for Suicide Research estimates that in 2013, 135 men and 181 women per 100,000 inhabitants attempted suicide in Flanders. Attempted suicides are the highest among men and women between 20 and 24 and between

40 and 50 years old. The rate of suicide attempts is the lowest among persons older than 60 years (Vancayseele et al., 2014).



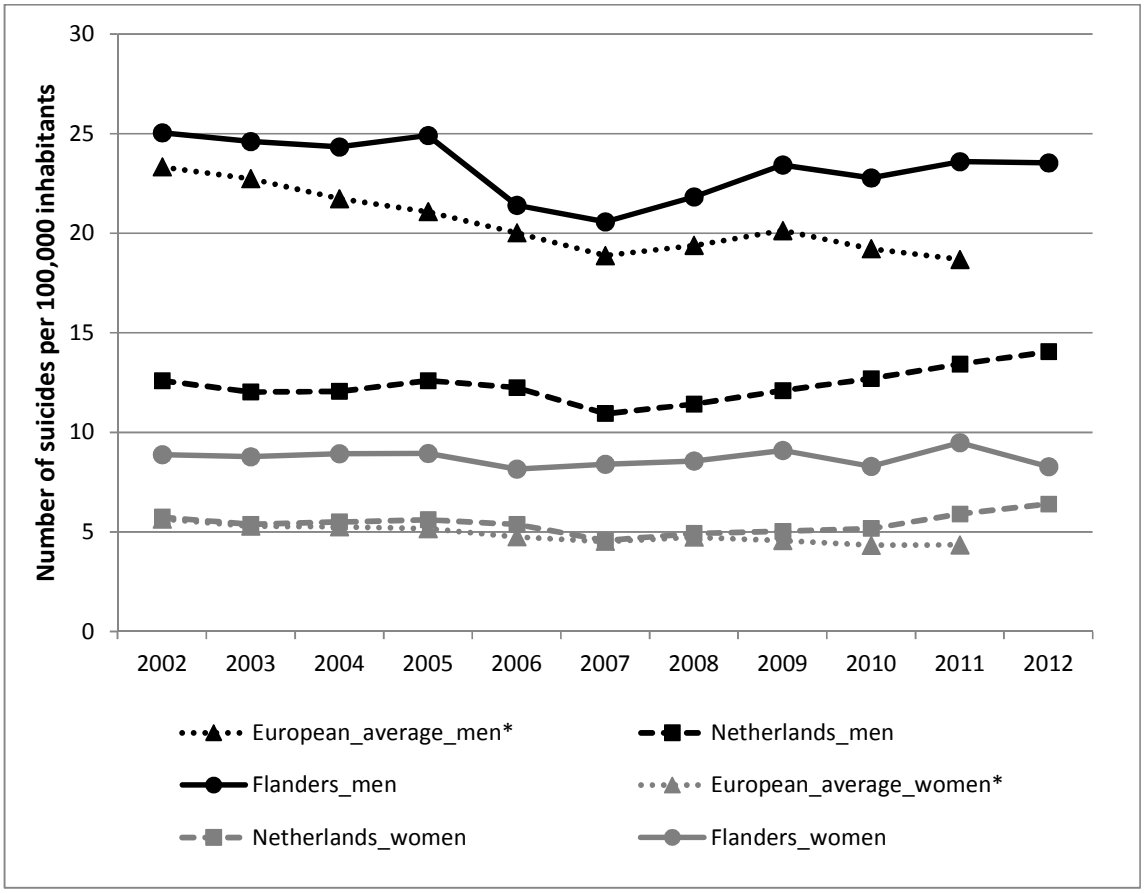
Graph 2 Age distribution of the percentage of suicide as a cause of death in Flanders and the Netherlands for men and women. Average for the years 2010-2012.
(Data source: Vlaams Agenschap voor Zorg en Gezondheid and Centraal Bureau voor Statistiek)

1.2 Time trends of suicide

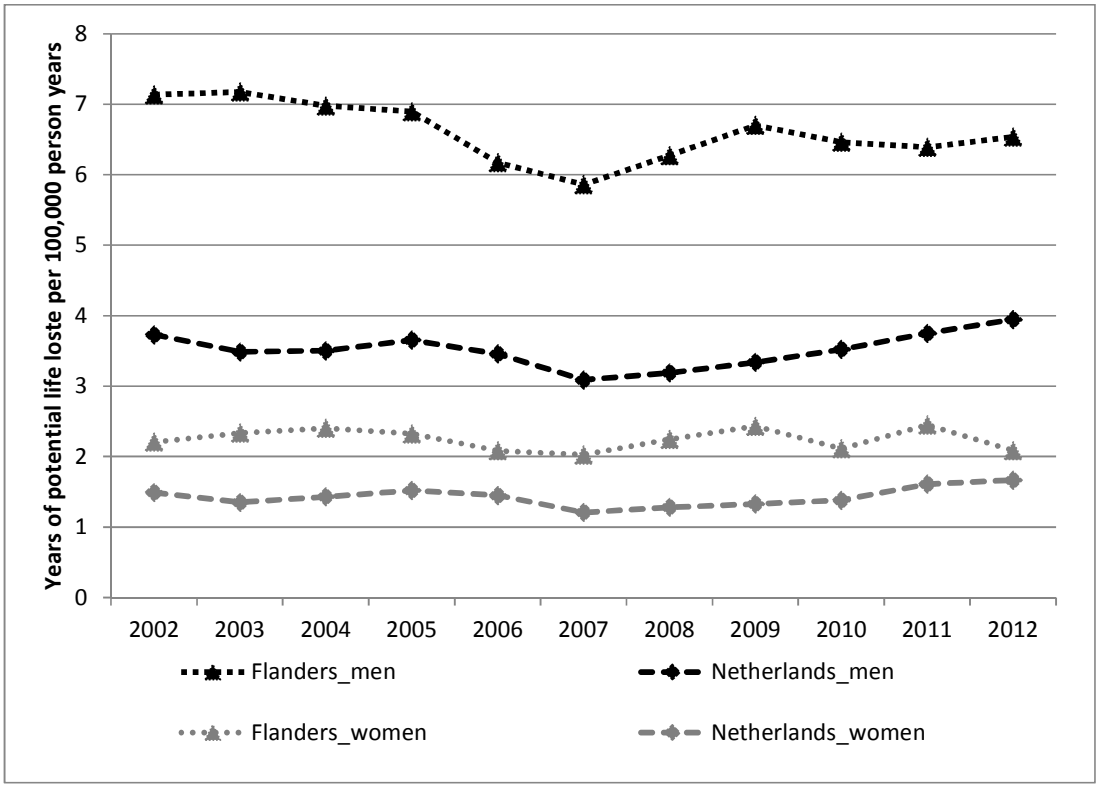
Graph 3 shows that male suicide rates stagnate (Netherlands) or decrease (Flanders and European average) between 2002 and 2007. From 2008 on suicide rates increase. Since 2010, the suicide rates decrease (European average) or stagnate (Flanders), while in the Netherlands the increasing trend continues. With respect to the female suicide rates, we observe a more stable time trend with the exception of an increase of the Dutch suicide rate since 2010.

Graph 14 shows the evolution of suicide in terms years of potential life lost (YPLL) per 100,000 life years. This measurement is an alternative for the mortality rates beacause it gives more weight to deaths among younger people. Nevertheless, the trend is similar to that of the suicide rates per 100.000 inhabitants. Since 2002, suicide accounts on average for 6.7 YPLL per 100,000 life years among Flemish men versus 3.5 YPLL among Dutch Men. For women YPLL is 2.3 years per 100,000 life years in Flanders and 1.4 years in the Netherlands. However, the last 4 years the suicide rates and YPLL of Flanders and the Netherlands seem to converge.

Time trend analysis of the suicide attempt rates based on data of the Unit of Suicide Research (Vancayseele et al., 2014) and the Flemish suicide rates, reveals that there is no strong positive association between both, neither for men (r = - 0.31), nor for women (r = 0.17).



Graph 3 Evolution of suicide rates per 100,000 inhabitants in Flanders, the Netherlands and the European average for men and women.
**** European average for 19 European countries for which data are available for each year between 2000 and 2010.***
(Data source: Vlaams Agenschap voor Zorg; Gezondheid and Centraal Bureau voor Statistiek and Eurostat)

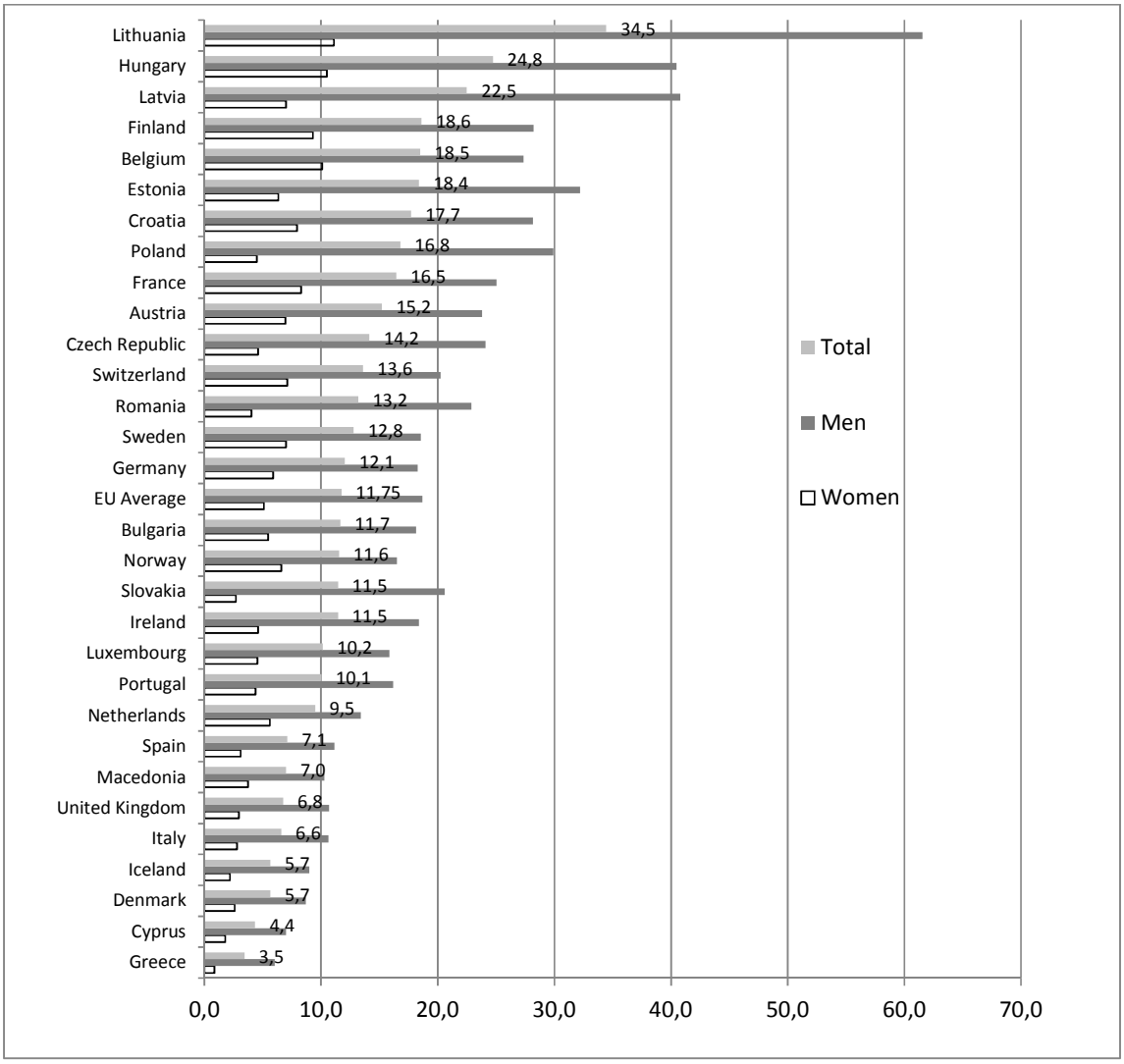


Graph 4 Evolution of years of potential life lost due to suicide per 100,000 life years in Flanders and the Netherlands for men and women (reference age is 75).
(Data source: Vlaams Agenschap voor Zorg; Gezondheid and Centraal Bureau voor Statistiek)

1.3 Differences between national and intra-national suicide rates

The common theme throughout this Thesis is the variation in regional and national suicide rates and its determinants. Therefore, it is of interest to illustrate the extent to which national and regional suicide rates vary. We will do so by comparing suicide rates within the European context.

Graph 5 shows the variability in suicide rates across Europe. The highest suicide rate (Lithuania: 34.5 / 100,000 habitants) is ten times higher than the lowest suicide rate (Greece: 3.5). We notice some clear tendencies. All three Baltic states are in the top five of the highest suicide rates. All the Southern-European countries have a suicide rate that is lower than the European average. A remarkable observation is that suicide rates can also differ substantially between neighbouring countries. For example, the suicide rates of Belgium (18.5), Ireland (11.5), Austria (15.2) and Macedonia (7.0) are much higher than the suicide rates of the respective neighbouring countries i.e. the Netherlands (9.5), United Kingdom (6.8), Italy (6.6) and Greece (3.5).



Graph 5 National suicide rates per 100,000 inhabitants (average 2009 –2010) in Europe.
(Data source: Eurostat)

These differences are relatively robust over time. For example, based on data of 19 European countries, we found that the Spearman rank order coefficient between the suicide rates of 2002/'03 and 2010/'11 was 0.93 ($p < .001$) for men and 0.77 ($p < .001$) for women.

Furthermore, regional suicide rates vary strongly within countries, as can be seen in Table 1. On average, the difference between the region with the lowest and the region with the highest suicide rate within a country is 9.7 suicides per 100,000 habitants. The average standard deviation is 3.0. These international data indicate that, even within a European context, suicide rates exhibit strong variation. The data also show that countries are not homogenous entities with respect to their regional suicide rates.

Based on data of ESEMED, there was no difference between Flanders and the Netherlands with respect to the prevalence of life time suicidal ideation (about 8.3%), nor with respect to life time suicide attempts (about 2.4%) (Bernal et al., 2007).

Table 1 Spread of NUTS 2 regional suicide rates per 100,000 inhabitants per country (2009-2010).

Country	Mean	Number of regions	Std. Deviation	Minimum	Maximum
Austria	15.3	9	2.1	12.5	18.8
Belgium	19.2	11	4.5	12.3	26.7
Bulgaria	11.9	6	2.0	9.1	14.7
CzechRepublic	14.2	8	1.2	12.1	16.1
Finland	16.8	5	4.7	9.1	21.4
France	18.7	21	4.3	8.0	27.8
Germany	12.2	43	1.8	8.7	16.3
Greece	3.8	13	0.9	2.5	4.9
Hungary	22.6	8	8.1	8.1	33.3
Ireland	11.7	2	0.4	11.5	12.0
Italy	6.8	19	1.7	4.0	9.8
Netherlands	9.6	12	1.3	7.5	11.7
Norway	11.6	7	2.3	9.3	15.1
Poland	17.3	16	3.0	11.8	21.6
Portugal	12.7	7	6.7	5.2	26.1
Romania	14.7	11	5.0	6.6	24.2
Slovakia	11.2	4	2.2	8.4	13.5
Spain	7.6	16	2.4	2.2	12.6
Sweden	13.1	8	1.8	10.9	17.2
Switzerland	12.9	7	2.1	9.3	15.8
United Kingdom	6.5	33	2.1	0.0	12.9
Total Europe	12.1	266	5.6	0.0	33.3

(Data source: Eurostat)

Finally, results from the Belgian Health Interview Survey indicate no significant differences between the Flemish provinces with respect to the incidence of suicidal ideation and suicide attempts (Drieskens et al. 2008-2013). The Unit of Suicide Research found that the suicide attempt rate was significantly higher in West-Flanders compared to the other Flemish provinces (Vancayseele et al., 2014).

2. Aims and research questions

The main aim of this Thesis is to contribute to our understanding of the factors predicting differences between regional and national suicide rates. To gain an insight in the contemporary knowledge on this topic, we will first conduct a literature study. This will allow us to better understand the mechanisms underlying the regional variations between suicide rates, but it will also expose the factors which received less attention. Building further on these findings, we will conduct three additional studies.

In Study 2, we present one paper on the reliability of suicide rates by comparing railway suicide statistics from two sources in 16 European countries.

Study 3 is a multilevel and longitudinal analysis of the relation between human values and regional suicide rates in 11 European countries after controlling for socio-economic factors.

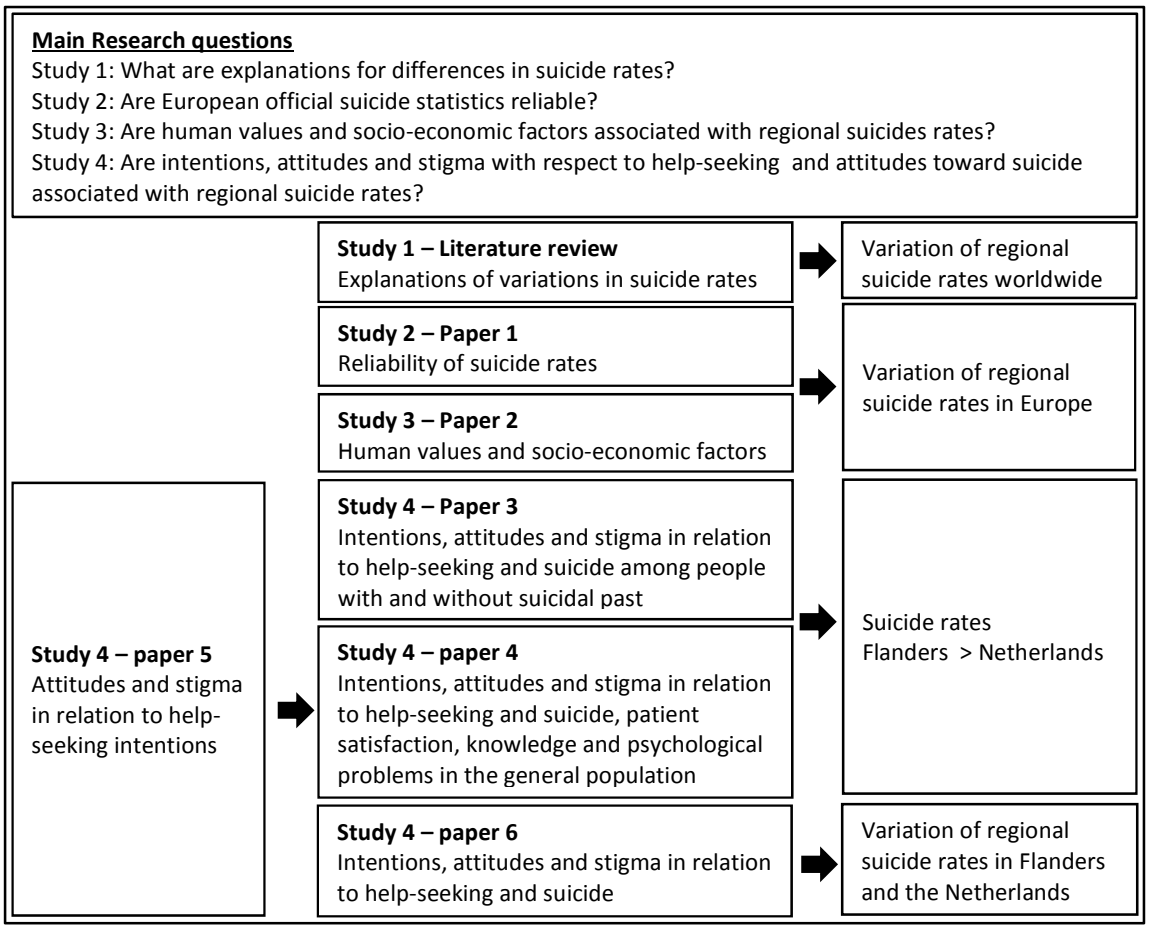
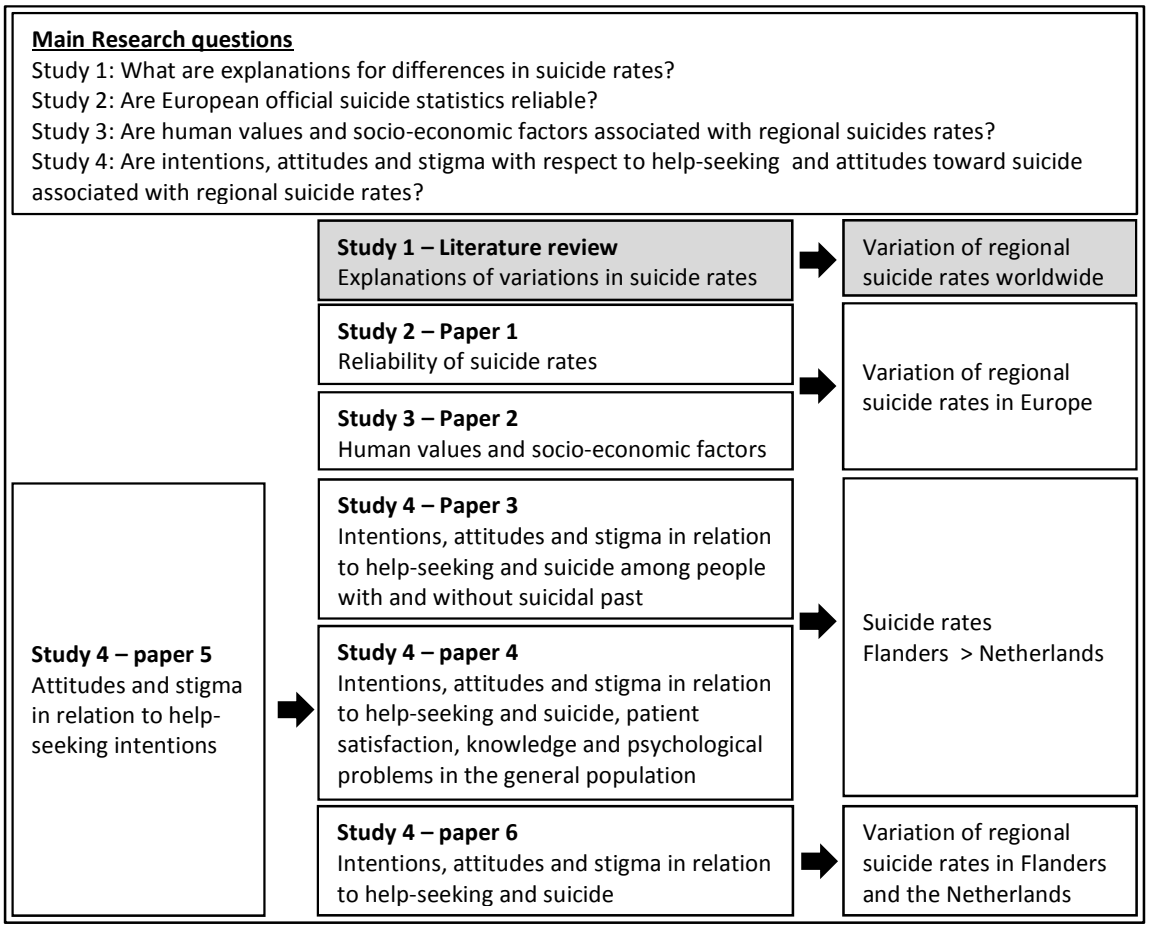


Figure 1 Overview of research questions and studies

Study 4 contains a theoretical framework and four papers on intentions, attitudes and stigma with respect to help-seeking and suicide. The main goal of these studies was to investigate if there is an association between these attitudinal factors and differences in suicide rates. The study was conducted in Flanders and the Netherlands (see Research question 4 - Study 4). To investigate factors associated with regional differences in suicide rates, it is of interest to compare regions that are similar to one another with respect to socio-economic indicators, language, geographic and demographic characteristics, but at the same time have strongly deviating suicide rates. Two regions that satisfy these conditions are Flanders and the Netherlands. However, there are also significant differences in suicide rates between the two Dutch speaking regions. The Flemish suicide rates are almost 80 percent higher (15.4/100,000 inhabitants) than in the Netherlands (8.8/100,000 inhabitants). Because the Brussels and Walloon regions of Belgium differ remarkably from Flanders and the Netherlands with respect to socio-economic factors, we decided not to include these regions in our analysis.

STUDY 1 - Literature study - Explanations for differences in suicide rates



Introduction

Although suicide seems to be a strictly individual act, we showed in the previous paragraphs that suicide rates vary between and within countries. This observation supports the assumption that besides individual level characteristics also contextual, area-based characteristics could explain the variance in regional suicide rates. In this study we discuss the evidence for factors predicting regional and national differences in suicide rates.

Therefore, we conducted a systematic literature search in PubMed. The search terms were: ((suicide) AND (international OR interregional OR cross-national OR cross-regional OR ecological OR multi-national OR spatial OR geographic OR regions OR nations OR area-based OR communities OR rates)) in the title or abstract published between 01/01/2000 and 01/08/2014. This resulted in 1989 publications. Next, the publications were screened for the following criteria: studies including an analysis of the association between regional or national suicide rates and regional or national level indicators within the general population. Publications were excluded when only analyzing differences between ethnic groups or other subgroups, longitudinal trends, suicidal ideation or non-lethal suicidal behavior, without analyzing associations with regional or national suicide rates. Furthermore, studies only describing geographical patterning without analyzing the association with possible predictors, were also excluded. 149 publications met these criteria. The references of these publications were screened for other studies not found by our initial query in PubMed. Another 28 publications were retained in this way. In this study we conduct a narrative analysis of these 177 publications.

Because most of the results presented in this study are based on official suicide statistics, we first will discuss the reliability of these statistics. In the following paragraphs we will successively discuss the associations between regional suicide rates and: social integration; suicidal ideation, suicidal behavior and attitudes toward suicide; mental health; availability and use of mental health care; Mental health policy and suicide prevention; the availability of suicide means; genetic factors; cultural factors and; rural versus urban suicide characteristics. Indicators which were subject in only a limited number of studies and which could not be included in the previous paragraphs were discussed in a separate paragraph. We end this Study with summarizing conclusions.

1. The reliability of suicide rates

Although not a determinant of the actual number of suicides, the quality of the causes of death statistics has an effect on the reliability of the suicide rates. The reliability of the suicide rates is determined by many factors. In the case of a suicide, the certifying person must assess if the cause of death is unnatural, intentional and self-inflicted. This assumes that, certainly in

dubious cases, the certifying person must have enough means and expertise to conduct a accurate post-mortem. A cross-section analysis of 35 countries worldwide as well as a longitudinal analysis showed that a decrease of one percent in the autopsy rate is associated with a decrease of more than 0.4 registered suicides per 100.000 inhabitants (Kapusta, Tran et al., 2011). In general two types of certifying sytems could be distinguished (Värnik et al., 2010). First, in countries with a medico-legal system, a medical procedure is applied. This means that decisions about the cause of death are made on the basis of the 'balance of probabilities'. Second, in most coronial systems, a legal procedure is in use. In this system, to certify a suicide as such, the criterium 'beyond reasonable doubt' is in effect. This could result in a systematic underestimation of certain types of suicide. Beside the differences between the two systems, there are also important differences within these systems. For example, there are differences in professional background and level of independence of the certifier (Värnik et al., 2010). Furthermore, there are differences in the type and quality of the training received by officials to interpret the death certificates and to assign the correct cause of death classification code. In some countries there is an efficient exchange between the statistics office and the instances conducting further forensic research, while in other countries this communication line is lacking. In addition, the clearity of the guidelines to decode and fill in death certificates can also differ significantly. A study found that in regions were the coroners more often wrote a narrative verdict, the suicide rates were lower than in regions where the coroner solely marked the category in a list of causes of death (Carroll, Hawton, Kapur, Bennewith, & Gunnell, 2012). Furthermore, in some Anglo-Saxon countries, third parties, such as insurance companies, have access to the content of the death certificates (Belanger, Bene, Bruzzone, & Denissov, 2008). In addition, in some regions, suicide is more subject to prejudices than in other regions. The certifying person could therefore experience pressure not to ascertain a cause of death as a suicide (Colucci, 2013). Finally, there are national and regional differences with respect to the most used methods of suicide. Some suicide methods, such as an overdose of medication, make it more challenging to determine the cause of dead. In regions where suicide victims more often use these kinds of methods, more suicides are misclassified. (Ajdacic-Gross, Weiss, Ring, Hepp, Bopp, Gutzwiller, & Rössler, 2008).

A review of the literature found that most studies indicated an underestimation of the official suicide rates, but also that there was a considerable variance between the countries worldwide (Tollefsen, Hem, & Ekeberg, 2012). While some researchers stated that official suicide statistics must be interpreted as *registered* suicides, others believe that, certainly in the Western world, suicide rates are sufficiently reliable and useful for comparative analysis (Chisti, Stone, Corcoran, Williamson, & Petridou, 2003).

2. Social integration

Emile Durkheim was one of the first to state that suicide has a distinct social character (Durkheim, 1951). According to Durkheim, the number of suicides in a society is determined by the level of social cohesion and social regulation of that society (Durkheim, 1951). Social cohesion refers to the level of connectedness between people by means of social relations. Social regulation is the degree to which needs and behavior are directed by norms. Based on the concepts of social cohesion and social regulation, Durkheim defined four types of suicide. A first type of suicide is the altruistic suicide. The risk of an altruistic suicide is the highest in communities where social cohesion is very strong. An example of an altruistic suicide is a monk who publically commits suicide to accuse a lack of religious rights. A second type of suicide is the egoistic suicide, which is the result of a lack social cohesion, as is for example the case within a highly individualistic society. Third, a fatalistic suicide refers to a suicide in a strongly regulated environment. An example would be the suicide of an inmate in a detention centre. The fourth type of suicide is the anomic suicide, which is caused by a lack of regulation. This could be the case in fast changing communities or in times of economic crisis. More recent, researchers ascertain that in modern society, altruistic and fatalistic suicides are rather rare (Fernquist & Cutright, 1998; Leenaars, Yang, & Lester, 1993). Furthermore, Durkheim himself noticed that anomie and egoism in society are two aspects of the same social context (Durkheim, 1951). As a result, contemporary researchers more often use the concept of social integration. It is assumed that sufficient levels of social integration will protect society and its members from suicide, while societies which lack social integration will be characterized by higher suicide rates. Social integration comprises different components. In the next three paragraphs, we will discuss socio-economic and political integration, social fragmentation and religious integration.

2.1. Socio-economic and political integration

Based on their literature review of studies from 1987 untill 2004, Rehkopf & Buka (2006) concluded that there is sufficient evidence for a negative association between levels of socio-economic integration and suicide rates. The indicators which showed the strongest positive associations with regional or national suicide rates were levels of poverty and deprivation. Furthermore, support was found for a negative association between average levels of education, employment rates and, to a lesser degree, average levels of income. More recent studies found a negative association between indicators of socio-economic integration and suicide rates in an analysis of European countries (Baumbach & Gulis, 2014; Fernquist, 2003, 2007; Ferretti & Coluccia, 2009; Ritter, Zitterl, & Stompe, 2013) countries worldwide (Breuer, 2014; Chang, Stuckler, Yip, & Gunnell, 2013; Milner, McClure, & De Leo, 2012b) developing countries (Vijayakumar, Nagaraj, Pirkis, & Whiteford, 2005) Australia (Cheung, Spittal, Pirkis, & Yip, 2012; Law, Snider, & De Leo, 2014; Page, Morrell, & Taylor, 2002; Qi, Hu, Page, & Tong,

2012), Belarus (Grigoriev, Doblhammer-Reiter, & Shkolnikov, 2013), Belgium (Hooghe & Vanhoutte, 2011; Lorant, 2000), Brazil (Faria, Victora, Meneghel, de Carvalho, & Falk, 2006), Canada (Auger, Zang, & Daniel, 2009; Desaulniers & Daigle, 2008), Germany (Richter, Baune, Vennemann, & Berger, 2009), Hungary (Balint, Dome, Daroczi, Gonda, & Rihmer, 2014), Italy (Martiello & Giacchi, 2012; Pompili et al., 2011), Japan (Fukuda, Nakamura, & Takano, 2004; Takeuchi, Sakano, & Miyatake, 2014), New Zealand (Blakely, Atkinson, & O'Dea, 2003), Slovenia (Korosec Jagodic, Rokavec, Agius, & Pregelj, 2013), South Korea (Cheong et al., 2012; Hong & Knapp, 2013; Lee, Lee, Noh, & Khang, 2014), Sweden (Magnusson & Makinen, 2010), Switzerland (Panczak et al., 2012), Taiwan (Chang et al., 2011), United Kingdom (Brock et al., 2006; Congdon, 2012a; Lester, 2000e; Rezaeian, Dunn, St Leger, & Appleby, 2005, 2007), and the United States (Barkan, Rocque, & Houle, 2013; Congdon, 2011; Phillips, 2013). Nevertheless, some studies found a positive association in West-European countries (Huisman & Oldehinkel, 2009) and Brazil (Bando, Brunoni, Bensenor, & Lotufo, 2012; Bando & Lester, 2014; Bando, Moreira, Pereira, & Barrozo, 2012) or no association in a worldwide analysis (Shah & Bhandarkar, 2008), in East-European countries (Huisman & Oldehinkel, 2009), and Finland (Martikanen, Mäki, & Blomgren, 2004).

Some studies investigated the association between political integration and suicide rates. A worldwide study found that indices of political integration such as election participation, freedom of speech and organization, and low levels of corruption were negatively associated with national suicide rates (Bezo, Maggi, & Roberts, 2012). Hungarian regions with higher levels of election participation were associated with lower suicide rates (Balint et al., 2014). More politically conservative US states were characterized by elevated suicide rates (Kposowa, 2013). A European study did not find an association between levels of 'European-ness ' and national suicide rates (Lester, 2003a).

2.2. Social fragmentation

Durkheim (1951) assumed that bigger families and strong family connections resulted in more social support, which has a protective effect on suicide. When strong family connections are well institutionalized within the community, this community as a whole would also be preserved from higher suicide rates. Family integration, often measured in terms of rates of marriage, divorce, birth, elderly, one person household, is an important aspect of what is called social fragmentation. A substantial number of studies investigated regional levels of family integration in relation to suicide rates. Studies found that suicide rates were negatively associated with marriage rates worldwide (Neumayer, 2003a), in Europe (Lorant, Kunst, Huisman, & Bopp, 2005) in Brazil, (Bando, Brunoni et al., 2012) in Slovenia (Korosec Jagodic et al., 2013) and in Germany (Richter et al., 2009) and positively associated with divorce rates in the United States (Cutright & Fernquist, 2004; Phillips, 2013), and Brazil (Faria et al., 2006). A study in Scotland did not find an association between regional suicide rates and the proportion of marriages and birth rates (Lester, 2010b). Adversely, two studies comparing nations

worldwide did find a negative association between birth rates and suicide rates (Milner et al., 2012b; Neumayer, 2003a). Furthermore, worldwide studies showed that nation level proportions of elderly were positively associated with general national suicide rates (Milner et al., 2012b; Shah, 2011). Intra-national analysis supported this observation in Belgium (Hooghe & Vanhoutte, 2011) and Germany (Richter et al., 2009). Higher levels of elderly in a region would be related to a lack of meaning in life within the general population (Hooghe & Vanhoutte, 2011) and increased social and psychological pressure because of a more extended caretaker role among the younger generations (Shah, 2011). The proportion of one person households, suggesting a higher level of social isolation, was found to be related with suicide rates in Belgium (Hooghe & Vanhoutte, 2011), Italy (Martiello & Giacchi, 2012), United Kingdom (Congdon, 2012a; Middleton et al., 2004) and the United States (Hempstead, 2006). Two studies used aggregated measures of social fragmentation and found a positive association with suicide rates in the United Kingdom (Evans, Middleton, & Gunnell, 2004; Hawton, Harriss, Hodder, Simkin, & Gunnell, 2001).

Another indicator of family integration is the proportion of females active on the labor market. It is assumed that female labor participation implies that men are challenged as head of the family and that they will receive less emotional support from their spouses. On the other hand, women will experience more stress because they will often need to combine a professional life with their daily household tasks (Neumayer, 2003b). Milner et al. (2012b) found in an analysis of 37 nations that a higher level of female labor participation was associated with higher suicide rates. Another study found that in countries where women had better access to social, political and economic power, suicide rates were elevated among women and men (Mayer, 2000).

Migration is also considered to be an indicator for social fragmentation. Migration is supposed to entail feelings of 'detachment' from the own community and family. In addition, migration could have a negative impact on the social cohesion of the guest community, because of the increased cultural diversity. In both cases, migration could lead to a lower level of social integration and thus increasedsuicide rates. Suicide rates of American states were positively related to residential instability caused by migration (Barkan et al., 2013). A cross-national analysis in 68 countries found that a higher percentage of immigrants within the general population was associated with higher suicide rates (Neumayer, 2003a). The same association was found in the United Kingdom (Congdon, 2012a; Middleton et al., 2004) and Brazil (Macente & Zandonade, 2012). A study in Belgium (Hooghe & Vanhoutte, 2011) and Taiwan (Chuang & Huang, 1997) found an opposite relation. In the Belgian study, this was explained by the observation that the suicide rate of most immigrant communities is lower than the average Belgian suicide rate. Another interpretation is that migration is often directed toward urban regions characterized with a higher socio-economic quality of life, which is assumed to be a protective factor for suicide (Chuang & Huang, 1997).

Closely related to social fragmentation is the concept of social capital. Social capital refers to voluntary relations and networks based on trust, which contribute to positive social action (Kelly 2008). Higher levels of social capital are therefore assumed to be a protective factor in relation to suicide. This assumption was confirmed by different studies which found a negative association between levels of social capital and national suicide rates worldwide (Bezo et al., 2012; Helliwell, 2006), in Europe (Kelly, Davoren, Mhaolain, Breen, & Casey, 2009) and the United States (Congdon, 2011; Cutlip, Bankston, & Lee, 2010). Some intra-national studies came to the same conclusion in Japan (Okamoto, Kawakami, Kido, & Sakurai, 2013), the Netherlands (Kunst, van Hooijdonk, Droomers, & Mackenbach, 2013) and the United Kingdom (Congdon, 2012b). As an indicator of a lack of social integration and thus rather the opposite of social capital, societal crime rates were not found to be associated with national suicide rates across 42 countries (Shah, 2008).

2.3. Religious integration

Durkheim argued that religion connects people and provides norms and values within the community (Durkheim, 1951). In other words, religion facilitates social regulation and integration. Based on this reasoning, it is hypothesized that religious communities have lower suicide rates than more secularized communities. In Europe (Ritter, Zitterl, & Stompe, 2011), the United States (Cutright & Fernquist, 2004; Kposowa, 2013; Lester, 2000c), Hungary (Balint et al., 2014), and the Netherlands (van Tubergen, te Grotenhuis, & Ultee, 2005), levels of religiousness were found to be negatively related to suicide rates. Van Tubergen et al. (van Tubergen et al., 2005) added that in a secularized country the religious norms rather than the integrative effect of religion play a protective role with respect to suicide. Not only the disapproval of suicide, but also the rejection of divorce and the encouragement of marriages have a protective effect on suicide. However, a Belgian study (Hooghe & Vanhoutte, 2011) and a cross-national study (Neumayer, 2003a) did not find evidence for a relation between religion and suicide rates. The authors argue that the effect of religion on suicide will continue to diminish in secularized communities. Finally, a negative association was found between the proportion of Muslims and national suicide rates (Shah & Chandia, 2010). However, Lester (Lester, 2000b) concluded that this association disappeared after adjusting for socio-economic factors.

3. Suicidal ideation, suicidal behavior and attitudes toward suicide

On an individual level, suicide is often preceded by a suicidal process of suicidal ideation and non-lethal behavior. Research showed that a suicide attempt is the best predictor of suicide (Suominen et al., 2004). Evidence for this suicidal process made researchers assume that on a

macro-level, prevalence of suicidal ideation and behavior would predict suicide rates. However, the WHO Multisite Study of Suicidal Behaviors did not find a clear association between the prevalence of suicidal thoughts, suicide attempts and suicide rates in ten regions (Bertolote, Fleischmann, De Leo, & Bolhari, 2005) and neither did the Outcome of Depression International Network Study in an analysis of five European countries (Casey et al., 2008). In the United States, suicide rates were associated with the prevalence of severe suicidal ideation (Hemenway & Miller, 2002), but not with deliberate self-harm (Claassen et al., 2008; Hempstead, 2006). Suicidal ideation detected within the context of primary health care in ten European countries was also not associated with suicide rates (Lester, 2000d). Furthermore, suicidal intentions were a weak predictor of suicide rates in a European study, but only among women (Hjelmeland et al., 2002). Epidemiologically, there is no sufficient evidence for a clear transition from suicidal ideation, through suicidal behavior to suicide.

Some researchers pointed out that there exists a national suicide culture (Cutright & Fernquist, 2001; Neumayer, 2003a). This national suicide culture refers to deeply rooted and generally shared attitudes, which facilitate or inhibit suicidal behavior. On an individual level a positive association between tolerant attitudes toward suicide and suicidal behavior has been repeatedly proven (Arnautovska & Grad, 2010; Gibb, Andover, & Beach, 2006; Joe, Romer, & Jamieson, 2007; Kocmur & Dernovsek, 2003; O'Connor, Armitage, & Gray, 2006).

On a macro-level however, the association between attitudes toward suicide and suicide rates is less clear. A cross-national study found that in Russia, characterized by higher suicide rates than Sweden and Norway, men more often had disapproving attitudes toward suicide than Swedish and Norwegian men (Renberg, Hjelmeland, & Kopsov, 2008). The authors assume that these negative attitudes are an expression of a negation and a repression of suicidal thoughts within a cultural context in which suicide is difficult to discuss. Adversely, a study in the United States (Cutright & Fernquist, 2004) and a cross- national study of 31 nations (Stack, 2008), found both that states with higher suicide rates are more often characterized by more approving attitudes among their citizens than states with lower suicide rates.

4. Mental health

It is estimated that around 90% of the people who died by suicide had psychological problems, mostly depressive symptoms (Cavanagh, Carson, Sharpe, & Lawrie, 2003, Nock, 2008). As a result, psychological problems are accepted as one of the most important risk factors of suicide. Although evidence for a relation between psychological problems and suicidal ideation and behavior is strong, the association at macro-level is less straightforward. A regional study in Scotland argued that the higher suicide rates in Scotland compared to England could be explained by the higher prevalence of psychological problems, alcohol and drug abuse (Mok et al., 2012). Other studies found an association between alcohol use and

suicide rates worldwide (Lester 2001), in European countries (Ritter et al., 2013), the United States (Phillips, 2013), Russia (Pridemore, 2006) and Slovenia (Korosec Jagodic et al., 2013). Two other studies found no association with alcohol use in Canada (Ramstedt, 2005) and in 21 nations of the world (Bridges, 2005). In Australia, no association between suicide rates and psychological disorders, alcohol and drugs abuse was found after adjusting for demographic and socio–economic factors (Taylor, Page, Morrell, Harrison, & Carter, 2005). In the United Kingdom, anxiety and depression were not associated and stress was moderately positive associated with regional suicides (Bartlett, Gunnel, Harrisson, & Moore, 2002). An analysis of 32 countries did not find an association between suicide rates and mental disorders, but they did find a negative association with psychological well-being, happiness and life-satisfaction (Bray & Gunnel, 2006). When including only West-European countries in the analysis, the association between suicide and psychological well-being, happiness and life-satisfaction rates became positive. This observation was confirmed by another European study (Daly, Oswald, Wilson, & Wu, 2011). This 'paradox of happiness' suggests that the negative effect of decreased psychological well-being is stronger in 'happier' regions. Nevertheless, two cross-national studies found no association between national suicide rates and happiness (Lester, 2002b) or psychological well-being (Lester, 2005c).

5. Availability and use of mental health care

In Europe, more than half of the people with psychological problems do not receive any professional help (Alonso et al., 2007). Receiving adequate psychological help is important to prevent psychological problems to aggravate and thus to reduce the risk of suicide (Deisenhammer, Huber, Kemmler, Weiss, & Hinterhuber, 2007). An important condition for receiving psychological help is the availability of mental health care providers. As a result, researchers hypothesized that regions with more and better accessible mental health care would be characterized by lower suicide rates. An Australian (Caldwell, Jorm, & Dear, 2004) and American (Searles, Valley, Hedegaard, & Betz, 2014) study concluded that higher suicide rates in rural areas could be explained by the lack of specialized psychological caregivers compared to urban areas. In Slovenia, higher suicide rates were found in regions with less psychiatric beds and less depression treatments (Korosec Jagodic et al., 2013). After adjusting for socio-economic factors, regional suicide rates were negatively associated with the availability of outpatient psychological care in Finland (Pirkola, Sund, Sailas, & Wahlbeck, 2009), but no association was found with the number of mental health service providers in Austria (N. Kapusta et al., 2010), nor in California (Fiske, Garz, & Hannell, 2005). Contrary to these findings, the number of physicians and the number of psychiatric beds were positively associated with higher state suicide rates in the United States (Tondo, Albert, & Baldessarini, 2006). In addition, cross-national studies showed that national suicide rates were positively

associated with the level of mental health provision (Rajkumar, Brinda, Duba, Thangadurai, & Jacob, 2013; Shah, Bhandarkar, & Bhatia, 2010).

A study in the United States found that in states where an increase of Selective Serotonin Reuptake Inhibiters (SSRI) prescriptions took place, suicide rates decreased, while in states characterized with an increased prescription of tricyclic antidepressants, suicide rates increased (Gibbons, Hurr, Bhaumik, & Mann, 2005). In a study of 29 European countries, a stronger increase of antidepressant use was related with a stronger decrease in suicide rates (Gusmão et al., 2013). But here also, the association is not unequivocal. A study of regional suicide rates in Hungary did not find a relation with antidepressant consumption (Viola, Benko, Nagy, & Soos, 2008). An analysis among OECD-countries showed that a higher antidepressant use was correlated with higher suicide rates (Kamat, Edgar, Niblock, McDowell, & Kelly, 2014).

6. Mental health policy and suicide prevention policy

In line with insights obtained in the previous paragraph, researchers investigated the hypothesis that regions or states with a better developed mental health policy or with higher mental health expenditures were characterized by lower suicide rates. A European study confirmed this hypothesis and showed that higher levels of national health spending were associated with lower suicide rates (Ferretti & Coluccia, 2009). However, other studies found no correlation between suicide rates and regional spending for well-being in Korea, nor between indicators of mental health policy on an international level (Shah et al., 2010), nor between mental health care spending in the United States (Ross, Yakovlev, & Carson, 2012). Moreover, another study conducted in the United States, found a positive relation between federal aid for mental health expenditures and state suicide rates (Tondo et al., 2006). Burgess et al. (2004) conducted research, encompassing 100 countries with respect to their mental health policy, action plans and legal frameworks. They ascertain that, after developing a mental health policy or after the implementation of mental health initiatives, most suicide rates increased. The only exception with a positive result were policies aimed at diminishing drug and alcohol abuse.

In France, regions with a suicide prevention policy recorded a decrease of the regional suicide rates. But after adjusting for socio-economic tendencies and evolutions in psychopharmaceutical drug prescriptions, the relation became unclear (Bellanger, Jourdain, & Batt-Moillo, 2007). A comparable but multi-national analysis concluded that a suicide prevention policy had a negative effect on suicide rates, but not among the active population (Matsubayashi & Ueda, 2011).

7. Availability of suicide means

The restriction of suicide means is an evidence-based suicide prevention strategy. The reason for this is that, when there are no suicide means easily available during a suicidal crisis, the opportunity to attempt a suicide decreases substantially because people at high risk of suicide are often not inclined or not able to seek for alternative suicide methods. Furthermore, the duration of a high risk suicidal crisis lasts between a few hours to a few days. Thus, if it can be prevented that suicide means are readily available during the relatively short period of the suicidal crisis, the suicide can be avoided definitely (Hawton, 2007).

The choice of suicide method is mainly determined by the cultural acceptability of the method and by the physical availability (Cantor & Baum, 1998). In Asian countries, intoxication by means of pesticides is the most used method, while in the United States and Switzerland fire arms are mostly used. In Scandinavian countries and the United Kingdom, intoxication by means of psychotropic drugs is the most used method, while in European countries this is suicide by hanging (Ajdacic-Gross, Weiss, Ring, Hepp, Bopp, Gutzwiller, & Rossler, 2008; Värnick et al., 2008). Different studies in the United States found that states with higher percentages of fire arms per household, were not only positively associated with higher levels of fire arm suicides, but also with total suicide rates (Hemenway & Miller, 2002; Kposowa, 2013; Miller, Azrael, & Hemenway, 2002; Miller, Barber, White, & Azrael, 2012; Miller, Warren, Hemenway, & Azrael, 2013; Phillips, 2013; Searles et al., 2014; Shrira & Christenfeld, 2010). In Taiwan, an epidemic of suicides by charcoal burning in urban regions caused the rural-urban differences in suicide rates to be leveled out (Chang, Gunnell, Wheeler, Yip, & Sterne, 2010). Also in Taiwan, the availability of pesticides was associated with regional differences in suicide rates (Chang et al., 2012).

8. Genetic factors

The evidence for a relation between genetic factors and suicide has been growing during the past years. Within molecular genetics as well as in behavioral genetics based on family, adoption and twins, research found support for a genetic vulnerability of suicide (Marusic & Farmer, 2001; Voracek & Marusic, 2008). On a macro-level, the Finno-Ugrian hypothesis is based on the observation that the J-shaped area from Finland, through the Baltic States, Hungary, Slovenia and Austria, is characterized by higher suicide rates compared to the neighboring countries. A great part of the population of these countries has a common Finno-Ugrian ethno-genetic background. Therefore, it is assumed that the Finno-Ugrians are as a group more vulnerable to suicide (Kondrich, 1995). A study of European countries provided some evidence for this hypothesis (Lester, 2004, 2010a; Voracek, Fisher, & Marusic, 2003; Voracek & Formann, 2004; Voracek & Marusic, 2008). In addition, analyses of demographics

supported this hypothesis in Romania (Voracek, Vintila, & Muranyi, 2007) Russia (Kandrychyn, 2004), Eastern-Europe (Voracek, Loibl, & Kandrychyn, 2007) and early 20th century United States (Voracek, 2006a). Other findings suggesting a genetic predisposition, are the consistency of migrant suicide rates with country-of-birth suicide rates (2008-2009) and regional patterning of surnames as a proxy of genetic background and regional suicide rates in Austria (2007). Another study, related to genetics as a predictor in 18 industrialized countries, found an association between blood type and suicide rates (Lester, 2004).

9. Cultural factors

Not only do global suicide rates vary regionally. It also appears that the epidemiology of suicide differs between regions. For example, suicide rates are the highest among the elderly in Western countries, while in Asian countries suicide rates are higher among young adults. Furthermore, the men/women suicide ratio in Western countries is on average 3:1, in Asian countries 2:1 and in rural China, the female suicide rates are higher than the male suicide rates (Vijayakumar et al., 2005). This points out that determinants of suicide rates do not have the same effect in every region. Researchers concluded therefore that culture also plays an important role in understanding regional suicide variation. Culture determines the level of acceptability toward suicide, the meaning of suicide, the role of risk and protective factors in relation to suicide, how people act upon life crises, etc (Colucci, 2006). Lester conducted extensive research on the relation between cultural traits and suicide rates of countries worldwide. His results were inconclusive. No relation was found between Hofstede's culture values (Hofstede, 1984) and national suicide rates (Lester, 2000a, 2003b, 2005a), except for one study (Lester, 2002a), which showed a negative relation with power distance (i.e. the level of acceptance of power inequality) and suicide rates. This association was confirmed by a study of Rudmin et al. (2003). The authors argued that rigid social norms and values such as obedience, play a role in relation to suicide. In contrast to Lester, Rudmin et al. (2003) found that suicide rates were positively correlated with individualism (i.e. the level of feeling autonomous and of feeling independent from family and other social groups). They hypothesized that individualism undermines social integration and therefore increases the risk of suicide. Lenzi et al. (2012) found also that individualism was positively associated with suicide rates worldwide. But when they only include post-traditional countries, they found that individualism was negatively correlated with suicide rates. In secular and rational societies, people are assumed to form their own identity and take their own social position. Individualism therefore has a positive influence on social regulation and integration in post-modern societies.

Lester also investigated worldwide national scores on the ‘Big Five’ personality traits and suicide rates, but no association was found (Lester, 2005b; Lester & Voracek, 2010). The absence of an association was confirmed by a study in Russia (Voracek, 2013). Another study

found a negative association between suicide rates and neuroticism (i.e. the tendency to experience negative emotions) in the United States (Voracek, 2009a) and agreeableness (i.e. the tendency to be friendly and compassionate) and conscientiousness (i.e. tendency to be efficient and well-organized) in a worldwide analysis (Lester, 2005b; Voracek, 2006e). Voracek (2007c) found a relation between suicide rates and a faster pace of life. Lester also researched the association between national anthems and suicide rates. He concluded that countries with higher suicide rates had anthems which were characterized by low notes, a sad connotation and gloominess (Lester & Gunn, 2011a, 2011b).

10. Rural versus urban characteristics

In most countries, rural suicide rates are higher than urban suicide rates (Hirsch, 2006). Our review confirmed this observation in Austria (Kapusta et al., 2008), Brazil (Macente & Zandonade, 2012), China (Liu et al., 2012), Ireland (Clarke, Bannon, & Denihan, 2003), Italy (Martiello & Giacchi, 2012), Taiwan (S. S. Chang et al., 2011) and the United States (Congdon, 2011; Hempstead, 2006; Johnson, Gruenewald, & Remer, 2009; Searles et al., 2014). Faira et al. (2006) found no difference between rural and urban suicide rates in a part of Brazil. Based on a review of the extensive Australian literature on this topic, Judd et al. (2006) provide an overview of explanations for the elevated rural suicide rates. The authors distinguish three levels of explanations: compositional, contextual and collective explanations. First, compositional factors refer to the individual characteristics of the people living in an area. They found that individuals living in rural areas more often have psychological problems. Furthermore, farmers appear to be an occupational group that is at higher risk of suicide. Second, with respect to contextual risk factors, the authors argued that rural areas become more socio-economically deprived compared to urban regions. In addition, health care providers and social well-fare services are less accessible for people living in remote areas. Third, as a collective explanation, the authors argue that rural areas are more characterized by a 'male culture' associated with less positive attitudes toward mental health care, more stigmatizing attitudes, less help-seeking behavior and more familiarity with fire arms.

These factors were also mentioned in a model of rural suicide (Stark, Riordan, & O'Connor, 2011) According to this model, the rural population is subject to elevated stress caused by social isolation, political exclusion and fast social and cultural changes. The elevated level of stress makes rural people more vulnerable to mental health problems and suicidal thoughts. Moreover, compared to urban areas, protecting factors, such as the availability of mental health care and positive attitudes toward help-seeking, are less available. This, together with the availability of suicide means, such as pesticide and fire arms, increases the risk of suicide.

In summary, we can state that elevated rural suicide rates are caused by the presence of many risk factors and the lack of protective factors of suicide at the level of the individual as well as

at the level of the region. The explanatory models for rural suicide rates include also a factor which has been neglected in most studies, in particular the role of stigma and attitudes related to psychological problems and psychological help-seeking.

11. Other associations: geographical factors, prevalence of diseases, intelligence and globalization

Because of the regional patterning of suicide rates, researchers investigated the association between suicide and geographical factors. Some studies found a positive association between latitude and suicide rates and conclude that light/dark cycles have an impact on the human mood (Davis & Lowell, 2002; Voracek & Formann, 2004). Lithium, used in therapeutic doses as mood stabilizers, is also found in small natural doses in drinking water. Studies in Texas and Austria found that higher regional levels of lithium were associated with lower suicide rates (Bluml et al., 2013; Helbich, Leitner, & Kapusta, 2012; N. D. Kapusta, Mossaheb et al., 2011). The Australian study showed that this relation becomes positive in higher altitude regions and that altitude in itself was positively associated with suicide rates. The latter association was confirmed in studies in the United States (Haws et al., 2009; Kim et al., 2011). Possibly, a decreased oxygen saturation is responsible for biogenetic dysfunction, which could lead to affective illness and thus increase the risk of suicide in high altitude regions (Haws et al., 2009).

Some researchers focused intensively on the relation between intelligence and suicide rates. Voracek found a positive association between levels of intelligence worldwide (Voracek, 2008) and between European countries (Voracek, 2007b), in Austria (Voracek, 2007d), Belarus , United Kingdom (Voracek, 2007b), Italy (Voracek, 2009b) and Denmark (Voracek, 2006b), but he found no association in France, Germany and the United States (Voracek, 2006c, 2006d, 2007a, 2007b). Some authors comment on these findings, arguing that after adjusting for religiousness or perceptions of personal health, these associations disappeared (Minkov, 2010). Questions were also raised wether IQ was measured or rather education attainment, which is determined by the quality of schools (Felice, 2010).

Globalization was also investigated in relation to suicide rates. A worldwide study of the association of national suicide rates with indices of global economy, political and social flows, indicated a positive association in East-European and Asian countries, a negative association in Scandinavian countries and no association in West-European countries (Milner, McClure, & De Leo, 2012a). Shah (2010), comparing 20 countries, found that internet use was positively related with suicide rates. He suggested that positive and encouraging statements about suicide on the internet increase the risk of suicide.

Finally, some studies investigated the association between the prevalence of diseases and suicide rates. Multi-national studies found an association between suicide rates and cancer

(Bridges & Williamson, 2003), the brain virsustoxo Plasma gondii (Lester, 2010a) and obesity in the United States (Mukamal, Wee, & Miller, 2009).

12. Conclusions

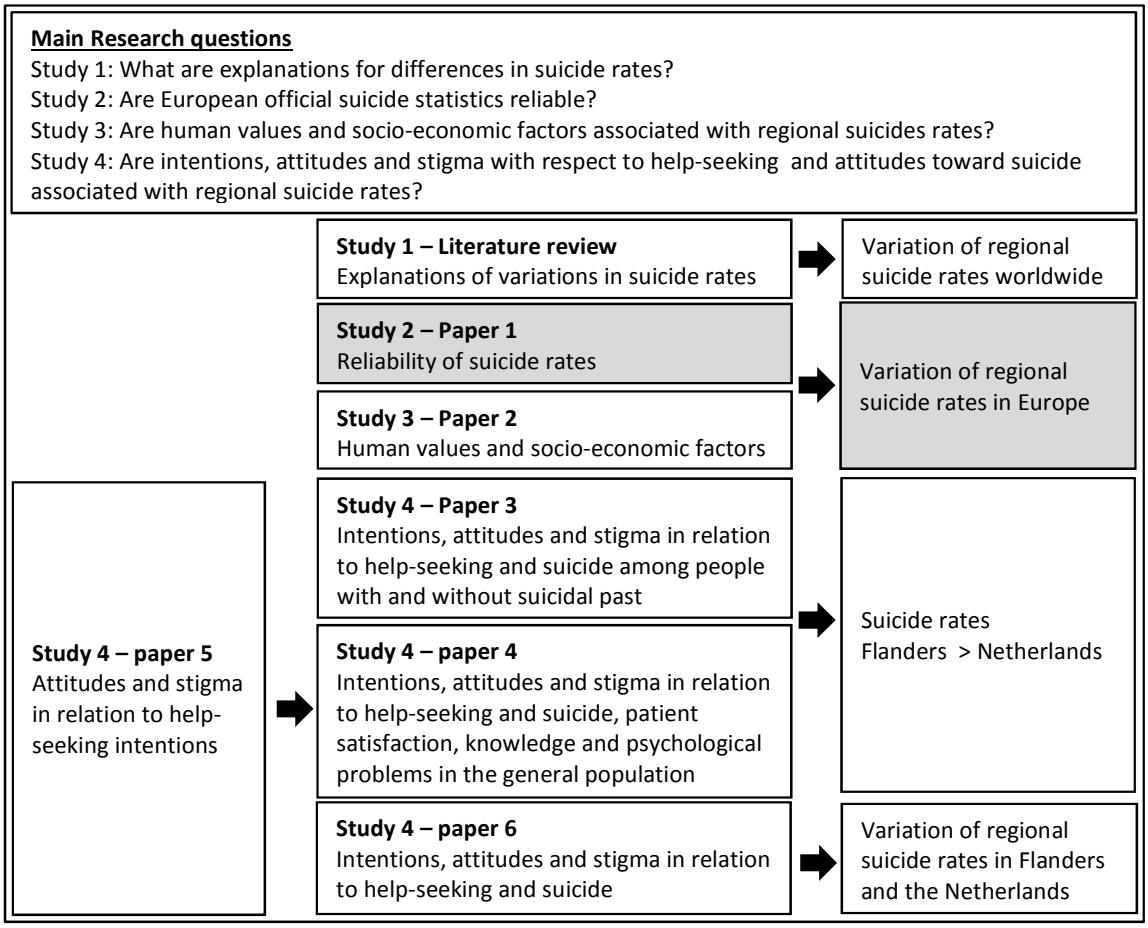
Based on the introduction and literature review, we can make the following critical observations with respect to differences between regional suicide rates and their explanations:

1. Suicide rates differ substantially between regions and countries.
2. There is uncertainty to what extent official suicide statistics are reliable and comparable.
3. Cultural values are mainly studied by comparing nations worldwide, resulting in inconclusive results. An important limitation of these studies is that the broader continental cultural context, nor intra-national cultural heterogeneity were taken into account.
4. Although positive attitudes toward suicide are associated with suicidal behavior on an individual level, associations on the macro-level are not clear.
5. Researchers emphasize the importance of intentions, attitudes and stigma in relation to help-seeking as a predictor for the variance of suicide rates, but the empirical evidence for this assumption is non-existent.

These observations expose important shortcomings in the contemporary literature. In the Studies 2 - 4, we will contribute to this discussion by further investigating the following three research questions:

Study 2 - paper 1:	Are European official suicide statistics reliable?
Study 3 - paper 2:	Are Human values and socio-economic factors associated with regional suicides?
Study 4 - paper 3-6:	Are intentions, attitudes and stigma with respect to help-seeking and attitudes toward suicide associated with regional suicide rates?

STUDY 2 - Paper 1: The reliability of suicide rates



The reliability of suicide rates: An analysis of railway suicides from two independent sources in fifteen European countries.

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Abstract

Background: National suicide data are an underestimation of the actual number of suicides but are often assumed to be reliable and useful for scientific research. The aim of this study is to contribute to the discussion of the reliability of suicide mortality data by comparing railway suicides from two data sources.

Methods: Data for the railway suicides and the concurrent causes of death of fifteen European countries were collected from the European Detailed Mortality Database and the European Railway Agency (ERA). Suicide rates, odds ratios and confidence intervals were calculated.

Results: The suicide data from the ERA were significantly higher than the national data for six out of fifteen countries. In three countries, the ERA registered significantly more railway suicides compared to the sum of the national suicides and undetermined deaths. In Italy and France, the ERA statistics recorded significantly more railway related fatalities than the national statistical offices. In total the ERA statistics registered 34% more suicides and 9% more railway fatalities compared with the national statistics.

Limitations: The findings of this study concern railway suicides and they cannot be extrapolated to all types of suicides. Further, the national suicide statistics and the ERA data are not perfectly comparable, due to different categorisations of causes of death.

Conclusions: Based on the data for railway suicides, it seems that the underestimation of suicide rates is significant for some countries, and that the degree of underestimation differs substantially among countries. Caution is needed when comparing national suicide rates. There is need for standardisation of national death registration procedures at the European level.

Keywords: railway suicide, reliability, registration and coding procedures, Europe

Introduction

In setting up suicide prevention strategies and assessing their effectiveness, policy makers and researchers depend to a large extent on national suicide statistics. The same holds for cross-cultural research, where one needs to rely on comparable suicide data. Therefore, it is of upmost importance that these national suicide statistics are sufficiently reliable. However, the reliability of suicide rates is a source of concern and scientists have scrutinized suicide statistics for decades.

Various factors may bias national suicide rates, making them vulnerable to criticism. Some conclude that, because of the many differences in ascertaining suicides, national suicide rates are not suitable to draw conclusions upon (Mathijs, 1980). Others state that suicide rates reflect cultural norms (Douglas, 1967). This leads to systematic biases and thus unreliable suicide rates. Therefore, Reseland et al. (2008) argues that national suicide statistics only reflect registered suicides and not the actual number of suicides.

Most other authors are less pessimistic about the quality of national suicide statistics. There is a general consensus that suicide rates are indeed an underestimation of suicide mortality (Belanger et al., 2008,c; De Leo and Evans, 2009; O'Carroll, 1989; Värnik et al., 2010; Walker et al., 2008). Depending on the research method, Claassen et al. (2010) found in their review that all but one study reported underestimations between 3 and 379 %. Nevertheless, suicide statistics are often assumed to be reliable. The main argument for this is that, when controlling for the estimated proportion of false negative suicides, the difference with the original suicide rates is not significant and the rank order of countries with regard to their suicide rates remains more or less the same (Andriessen, 2006; Barraclough, 1973; Chishti et al., 2003; Jougla et al., 2002). False negative suicides can be misclassified under many other causes of death. The most important concurrent categories are accidents, undetermined causes and undetermined intent. Evidence for this is found in the clinical and socio–demographic associations between these concurrent categories and suicide (Connolly and Cullen, 1995; Linsley et al., 2001; Marušič et al., 2003; Ohberg and Lonnqvist 1998; Platt et al., 1988). Therefore, authors suggest to take these concurrent categories into account when analyzing suicide rates based on national suicide statistics (Atkinson et al., 1975; Barraclough, 1973; Jougla et al., 2002; Reseland et al., 2008).

Overall, the tenor of this discussion seems to be that national suicide statistics underestimate the actual number of suicides. There is less agreement about the reliability and comparability of the national suicide rates.

In the present study, we will contribute to this vivid discussion by comparing the national railway suicide, accident and undetermined intent statistics with suicide and accident statistics from the European Railway Agency (ERA) for 15 European countries. We restrict our analysis to railway suicides because only for this type of suicide, statistics from two mostly independent sources are available. Our research questions are: are the national suicide statistics reliable and can we find differences in reliability among the fifteen European countries? Before formulating our hypothesis, we clarify our premises.

First, as is the case for all suicides, we may assume that the national suicide statistics underestimate the actual number of railway suicides, although to a lesser extent. On the one hand, the intent of railway fatalities is more difficult to determine than death by hanging or carbon monoxide poisoning by inhalation of car exhaust fume. On the other hand, however, determining the underlying intent of railway fatalities is overall less complicated than for

example drowning or intoxication. In the case of a railway incident, a witness (driver or bystanders) is nearly always present. He or she can give valuable information on the behaviour of the victim moments before the accident, given that approximately seven out of ten persons who commit suicide by hitting a train, lie, stand or wander on or near the rails (De leo and Krysinska, 2008; Dinkel et al., 2010; Rådbo et al., 2005). Further, there are often clear secondary clues for railway suicides. Compared with the total population of those who commit suicide, people who commit a railway suicide more often have a severe psychiatric disorder or a history of psychiatric care, are more often receiving treatment or are an inpatient at the moment of the suicidal act (Huisman et al., 2010; Krysinska and De Leo, 2008; Ladwig et al., 2009; van Houwelingen and Kerkhof, 2008;). As a consequence, we could assume that the intention behind railway fatalities is less complicated to assess, making railway statistics more reliable than the overall suicide statistics. Therefore, we expect that the proportion of railway fatalities for which the intent is undetermined on the number of railway suicides, is lower than the total proportion of undetermined intent on the total number of suicides. As will be illustrated later, this holds true for ten out of fifteen countries (Table 1).

Second, the statistics from the ERA can be considered as a standard to compare the national suicide statistics with. The ERA gather information from the national safety authorities who in their turn receive the data from the railway related safety organisations (RSO). In most countries, RSO have no access to the death certificate which is sent to the national suicide statistical offices. Therefore, RSO depend for information on their own (safety) staff, coroners, police and legal authorities. This means that RSO and national statistical offices share common sources making them not entirely independent. Nevertheless, RSO can independently decide to classify a fatality as a suicide. For example, in the UK where third parties do have access to the content of the death certificates, RSO classify a fatality as a suicide when the coroner's verdict is suicide. In case the coroner has yet to return a verdict, an open verdict is returned or the verdict is accident, it is classified as a (suspected) suicide when there is evidence for a suicide according to the Ovenstone criteria (Ovenstone, 1973). The Ovenstone criteria take into account primary clues (i.e. method used, suicide note, etc.) as well as secondary clues (i.e. history of suicidal behaviour, psychiatric disorders, etc.) in determining the cause of death.

Third, as will be discussed in detail in the Materials and methods Section, the national suicide data should contain more suicide cases than the ERA data because the latter contains only train railway fatalities, while national suicide statistics also include fatalities caused by hitting other moving objects such as metro, tram and other vehicles.

Thus summarizing, the railway suicides statistics are assumed to be more reliable than overall suicide statistics. More reliable statistics will underestimate the actual number of suicides to a lesser extent compared to more unreliable sources. The national and the ERA statistics are comparable but the national suicide statistics cover more types of suicide than the ERA statistics.

We hypothesise that:

- national mortality statistics for railway suicides will be higher than the ERA data.
- possible discrepancies between the two datasets are roughly the same for all countries.
- national mortality statistics are reliable.

Materials and Methods

Data sources

We collected data on railway suicides, accidents and undetermined intents from national statistical offices and railway suicides and accidents from the ERA for the years 2006 and 2007. Data from both sources were available for fifteen European countries (Austria, Belgium (only Flemish Region), Czech Republic, Finland, France, Germany, Hungary, Italy, Latvia, The Netherlands, Norway, Poland, Slovenia, Sweden and United Kingdom).

The national mortality data for railway suicides and concurrent causes of death, i.e. undetermined intent and accidents (N=5789), were obtained from the European Detailed Mortality Database (World Health Organization Regional Office for Europe, 2010).

In the ICD-10 (International Classifications of Diseases, 10th revision), railway suicides are classified under 'x81 - Intentional self-harm by jumping or lying before a moving object'. Railway accidents of which the intention is undetermined are classified under 'y31 - Falling, lying or running before or into a moving object - undetermined intent'. The code x81 and y31 do also conclude collisions with other vehicles than railway vehicles. The codes V-05, -15, -25,-35, -45, -55, -65, -75 refer to all accidental injuries caused by a collision with a railway vehicle resulting in death, thus also including metro and trams.

The reporting of railway accident information on a European level is covered by two separate EU legislations. Regulation (EC) No 91/2003 for reporting data to Eurostat and the Safety Directive 2004/49/EC for reporting data to the European Railway Agency (ERA). The latter agency is the source for our ERA data (European Railway Agency, 2009), except for Belgium and the United Kingdom, for which updated data were gathered from respectively Infrabel and Railway Safety and Standard Board. Since 2006, the quality of statistics on railway fatalities gathered and managed by ERA has improved considerably (European Railway Agency, 2009). Therefore, we only take into account the data of 2006 - 2007.

The ERA statistics divide railway fatalities into suicides and accidents. No category for undetermined intent is foreseen. For the purpose of the present study, we only consider 'level crossing accidents' and 'accidents to persons caused by rolling stock'. These accident types include pedestrians, cyclists, drivers and passengers of a vehicle. They exclude deaths due to collisions between trains, fire and electrocution. The data (N=6323) refer only to train accidents and exclude tourist trains, trams, metros or other vehicles.

Data analysis

For the statistical analyses, SPSS 16.0.2 was used. Total age standardised suicide and undetermined intent rates were expressed per 100.000 inhabitants, using the world standard population (Waterhouse et al., 1976; World Health Organization Regional Office for Europe, 2010). The railway-related fatalities are also expressed per 100.000 inhabitants. We calculated only raw standardised rates, because information for age and sex distribution of the ERA was lacking. To test the significance of the differences, rates are presented with 95% confidence intervals. Finally, we compared the rank order of these rates by calculating Kendall's tau rank order coefficient (τ).

Results

The highest age-standardised suicide rates (table 1) were observed in Hungary (21.4 / 100.000 people) and the lowest in Italy (5.2). The category 'undetermined intent' was the least often used by Norway (0.0), while Poland (6.4) classified the highest proportion of deaths in this category. On average, 4.2 percent of the suicides is caused by hitting a moving object.

Table 1: Age standardised suicide rates (2007) and proportions of railway suicides and undetermined intent (2006-07) – source: national mortality statistics.

	Rate per 100 000 inhabitants Suicide (2007)	Rate per 100 000 inhabitants undetermined intent (2007)	Percentage railway suicides on the total number of suicides (2006-07)	Percentage 'railway undetermined intent' on the sum of 'railway suicides' and 'railway undetermined intent' (2006-07)	Percentage 'undetermined intent' on the sum of 'suicides' and 'undetermined intent' (2006-07)
Austria	13.2	1.5	6.5	9.7	10.2
Belgium (Flanders)	14.4	1.8	6.5	3.1	11.8
Czech Republic	11.9	4.2	2.4	15.2	25.6
Finland	17.6	1.3	5.7	4.8	7.0
France	14.7	0.7	1.8	13.4	4.4
Germany	9.8	2.2	6.0	8.6	19.3
Hungary	21.4	1.3	4.0	11.7	5.7
Italy	5.2	0.1	1.5	0.0	1.8
Latvia	17.8	2.1	0.4	33.3	19.0
The Netherlands	7.7	0.3	13.0	0.5	4.7
Norway	10.0	0.0	1.6	0.0	0.0
Poland	12.9	6.4	0.5	10.3	46.7
Slovenia	18.4	3.7	1.7	33.3	15.8
Sweden	11.4	3.4	6.9	10.0	25.4
United Kingdom	6.5	2.4	4.5	16.1	31.3
Average	*12.9*	*2.1*	*4.2*	*11.3*	*15.2*

In the case of the Netherlands (13 percent), this was more than three times higher, while for Latvia, the statistics show that in only 0.4 percent of suicides this method was used.
For ten countries, the proportion of railway fatalities for which the intent is undetermined on the total number of railway suicides plus 'undetermined intent' was lower than the proportion of all 'undetermined intents' on the sum of all the suicides plus 'undetermined intents'.

Table 2 shows that, according to the national data, in total 57 percent of the fatalities caused by hitting a moving object were suicides, compared to 70 percent according to the ERA data. In total, in 5.7 percent of the fatalities caused by hitting a moving object, the intention remained undetermined.

Table 2. Railway fatality statistics from the national statistic offices and the ERA, absolute number and ratio's (2006 – 07).

	Cause of death	National data		ERA data		Ratio $\frac{SUI^{ERA}}{SUI^{Nat}}$	Ratio $\frac{SUI^{ERA}}{SUI^{Nat} + UI^{Nat}}$
		N	%	N	%		
Austria	SUI	167	61.6	191	67.3	1.14	1.03
	UI	18	6.6	-	-		
	ACC	86	31.7	93	32.7		
	TOT	271	100	284	100		
Belgium	SUI	127	79.9	134	84.3	1.06	1.02
(Flanders)	UI	4	2.5	-	-		
	ACC	28	17.6	25	15.7		
	TOT	159	100	159	100		
Czech	SUI	67	18.1	324	81.0	4.84	4.10
Republic	UI	12	3.2	-	-		
	ACC	292	78.7	76	19.0		
	TOT	371	100	400	100		
Finland	SUI	118	76.1	96	70.1	0.81	0.77
	UI	6	3.9	-	-		
	ACC	31	20.0	41	29.9		
	TOT	155	100	137	100		
France	SUI	369	63.5	695	81.8	1.88	1.63
	UI	57	9.8	-	-		
	ACC	155	26.7	155	18.2		
	TOT	581	100	850	100		
Germany	SUI	1154	69.4	1379	78.9	1.19	1.09
	UI	108	6.5	-	-		
	ACC	402	24.2	369	21.1		
	TOT	1664	100	1748	100		
Hungary	SUI	197	52.8	244	64.9	1.24	1.11
	UI	23	6.2	-	-		
	ACC	153	41.0	132	35.1		
	TOT	373	100	376	100		
Italy	SUI	111	39.1	264	65.2	2.38	2.38
	UI	0	0.0	-	-		
	ACC	173	60.9	141	34.8		
	TOT	284	100	405	100		
Latvia	SUI	4	4.7	16	21.6	4.00	2.67
	UI	2	2.4	-	-		
	ACC	79	92.9	58	78.4		
	TOT	85	100	74	100		
Netherlands	SUI	374	90.6	383	91.4	1.02	1.02
	UI	2	0.5	-	-		
	ACC	37	9.0	36	8.6		
	TOT	413	100	419	100		
Norway	SUI	16	72.7	19	90.5	1.19	1.19
	UI	0	0.0	-	-		
	ACC	6	27.3	2	9.5		
	TOT	22	100	21	100		

SUI: suicide, UI: undetermined intent, ACC: accidents, TOT: total

^{Nat}: data from national statistical offices, ^{ERA}: data from ERA

Table 2. Railway fatality statistics from national statistic offices and ERA, absolute number and ratio's (2006 -07) - continued

	Cause of death	National data		ERA data		Ratio $\frac{SUI^{ERA}}{SUI^{Nat}}$	Ratio $\frac{SUI^{ERA}}{SUI^{Nat} + UI^{Nat}}$
		N	%	N	%		
Poland	SUI	58	9.2	54	8.2	0.93	0.84
	UI	6	1.0	-	-		
	ACC	565	89.8	601	91.8		
	TOT	629	100	655	100		
Slovenia	SUI	16	28.1	20	34.5	1.25	0.83
	UI	8	14.0	-	-		
	ACC	33	57.9	38	65.5		
	TOT	57	100	58	100		
Sweden	SUI	160	79.6	147	77.8	0.92	0.84
	UI	16	8.0	-	-		
	ACC	25	12.4	42	22.2		
	TOT	201	100	189	100		
United Kingdom	SUI	360	68.7	462	84.3	1.28	1.08
	UI	69	13.2	-	-		
	ACC	95	18.1	88	15.7		
	TOT	524	100	550	100		
TOTAL	SUI	3298	57.0	4428	70.0	1.34	1.22
	UI	331	5.7	-	-		
	ACC	2160	37.3	1897	30.0		
	TOT	5789	100	6325	100		

SUI: suicide, UI: undetermined intent, ACC: accidents, TOT: total
^{Nat}: data from national statistical offices, ^{ERA}: data from ERA

Except for Finland, Poland and Sweden, no other country had an national railway suicide number (SUI^{Nat}) that exceeds the data from the ERA (SUI^{ERA}). The ERA data were 2% (the Netherlands) up to 383% (Czech Republic) higher than the national data.

Except for Finland, Poland, Sweden and Slovenia, the number of suicides from the ERA (SUI^{ERA}) statistics was higher than the sum of the national number of railway suicides and undetermined intents ($SUI^{Nat} + UI^{Nat}$).

Expressed per 100.000 inhabitants (table 3), the national suicide rates (SUI^{Nat}) were significantly lower than the ERA data (SUI^{ERA}) for six countries. This difference remained significant for the Czech Republic, France and Italy when adding the cases for which the intent was undetermined. For all countries but Belgium, Finland, Latvia, Norway and Sweden the total number of railway fatalities was higher in the ERA statistics than in the national statistics. For France and Italy, this difference was significant.

Table 4 ranks the 15 countries according to their railway suicide rates. The rank order of the national railway suicide rates (SUI^{Nat}) changed when adding undetermined intents ($SUI^{Nat} + UI^{Nat}$), but Kendall's tau rank order coefficient (τ) remained high ($\tau = .91 p<0.01$). The countries rank order changed remarkably when using suicide rates of ERA. The Kendall's tau rank order coefficient (τ) for '$SUI^{Nat} + UI^{Nat}$' and 'SUI^{ERA}' is .60 ($p<0.01$).

Table 3. Raw railway fatality rates from national statistic Office and ERA (2006 -07).

	Rate per 100 000 SUI^{Nat} (95% CI)		Rate per 100 000 $SUI^{Nat} + UI^{Nat}$ (95% CI)		Rate per 100 000 $SUI^{Nat} + UI^{Nat} + ACC^{Nat}$ (95% CI)		Rate per 100 000 SUI^{ERA} (95% CI)		Rate per 100 000 $SUI^{ERA} + ACC^{ERA}$ (95% CI)	
Austria	1.01	(0.86-1.16)	1.12	(0.96-1.28)	1.64	(1.44-1.83)	1.15	(0.99-1.32)	1.71	(1.52-1.91)
Belgium (Flanders)	1.04	(0.86-1.22)	1.07	(0.89-1.26)	1.30	(1.10-1.51)	1.10	(0.91-1.28)	1.30	(1.10-1.51)
Czech Republic	**0.33[a]**	(0.25-0.40)	**0.38[b]**	(0.30-0.47)	1.81	(1.62-1.99)	**1.58[a.b]**	(1.41-1.75)	1.95	(1.76-2.14)
Finland	1.12	(0.92-1.32)	1.18	(0.97-1.38)	1.47	(1.24-1.70)	0.91	(0.73-1.09)	1.30	(1.08-1.52)
France	**0.29[a]**	(0.26-0.32)	**0.34[b]**	(0.30-0.37)	**0.46[c]**	(0.42-0.50)	**0.55[a.b]**	(0.51-0.59)	**0.67[c]**	(0.63-0.72)
Germany	**0.70[a]**	(0.66-0.74)	0.77	(0.72-0.81)	1.01	(0.96-1.06)	**0.84[a]**	(0.79-0.88)	1.06	(1.01-1.11)
Hungary	0.98	(0.84-1.12)	1.09	(0.95-1.24)	1.85	(0.67-2.05)	1.21	(1.06-1.36)	1.87	(1.68-2.06)
Italy	**0.09[a]**	(0.08-0.11)	**0.09[b]**	(0.08-1.11)	**0.24[c]**	(0.21-0.27)	**0.22[ab]**	(0.20-0.25)	**0.34[c]**	(0.31-0.38)
Latvia	**0.09[a]**	(0.00-0.17)	0.13	(0.03-0.24)	1.86	(1.46-2.25)	**0.35[a]**	(0.18-0.52)	1.62	(1.25-1.99)
The Netherlands	1.14	(1.03-1.26)	1.15	(1.03-1.27)	1.26	(1.14-1.39)	1.17	(1.05-1.29)	1.28	(1.16-1.40)
Norway	0.17	(0.09-0.25)	0.17	(0.09-0.25)	0.23	(0.14-0.33)	0.20	(0.11-0.29)	0.22	(0.13-0.32)
Poland	0.08	(0.06-0.10)	0.08	(0.06-0.11)	0.82	(0.76-0.89)	0.07	(0.05-0.09)	0.86	(0.79-0.92)
Slovenia	0.15	(0.08-0.22)	0.22	(0.13-0.31)	0.53	(0.39-0.67)	0.19	(0.10-0.27)	0.54	(0.40-0.68)
Sweden	0.88	0.74-1.01)	0.97	(0.82-1.11)	1.10	(0.95-1.26)	0.81	(0.68-0.94)	1.04	(0.89-1.19)
United Kingdom	**0.30[a]**	(0.27-0.33)	0.35	(0.32-0.39)	0.43	(0.40-0.47)	**0.38[a]**	(0.35-0.42)	0.45	(0.41-0.49)
Total	**0.43[a]**	(0.42-0.45)	**0.48[b]**	(0.46-0.49)	**0.76[c]**	(0.74-0.78)	**0.58[ab]**	(0,56-0,60)	**0.83[c]**	(0.81-0.85)

SUI: suicide, UI: undetermined intent, ACC: accidents

^{Nat}: data from national statistical offices, ^{ERA}: data from ERA

[a] significant difference between SUI^{Nat} and SUI^{ERA} .

[b] significant difference between $SUI^{Nat} + UI^{Nat}$ and SUI^{ERA}.

[c] significant difference between $SUI^{Nat} + UI^{Nat} + ACC^{Nat}$ and $SUI^{ERA} + ACC^{ERA}$.

Discussion

The national statistical offices of Finland and Sweden register more railway fatalities and more specific suicides compared to the ERA statistics. The strongest accordance between the two sources was found for Belgium and the Netherlands. These countries seem to have the most reliable national mortality statistics. The national statistical offices in Austria, Germany, the UK, Hungary and Slovenia register fewer suicides than ERA but the difference reduces considerably when adding cases for which the intent is undetermined. For these countries, it is advised to take concurrent causes of death into account when interpreting suicide rates.

The national statistics for the Czech Republic, Latvia, and Poland seem rather unreliable because there is a remarkable discrepancy between the national suicide statistics and the ERA statistics (Czech Republic and Latvia) and because the proportion of suicides on the total number of railway fatalities is questionably low. According to the national statistics, in none of these countries the proportion of suicides exceeds 19% on the totality of the railway fatalities. The European average is 57%.

Table 4. National rank order based on raw railway fatality rates from the national statistical Office and the ERA (2006 -07).

	Rate per 100 000 SUI^{Nat}	Rate per 100 000 $SUI^{Nat} + UI^{Nat}$	*Rank order* $SUI^{Nat} + UI^{Nat}$	Rate per 100 000 SUI^{ERA}	*Rank order* SUI^{ERA}
Poland	0.08	0.08	1	0.07	1
Latvia	0.09	0.13	*3*	0.35	*5*
Italy	0.09	0.09	2	0.22	4
Slovenia	0.15	0.22	*5*	0.19	*2*
Norway	0.17	0.17	4	0.20	3
France	0.29	0.34	*6*	0.55	*7*
United Kingdom	0.30	0.35	*7*	0.38	*6*
Czech Republic	0.33	0.38	*8*	1.58	*15*
Germany	0.70	0.77	*9*	0.84	*9*
Sweden	0.88	0.97	10	0.81	8
Hungary	0.98	1.09	12	1.21	14
Austria	1.01	1.12	*13*	1.15	*12*
Belgium (Flanders)	1.04	1.07	*11*	1.10	*11*
Finland	1.12	1.18	*15*	0.91	*10*
Netherlands	1.14	1.15	*14*	1.17	*13*

SUI: suicide, UI: undetermined intent, ACC: accidents

^{Nat}: data from national statistical offices, ^{ERA}: data from railway ERA

Puzzling results were found for Italy and France. Not only the number of suicides but also the total number of railway fatalities is significantly lower in the national statistics compared to the ERA statistics.For all countries together, ERA reported 34.3% more suicides and 9.3% more railway fatalities compared to the national statistics.

Despite the general acknowledgement that suicide rates are underestimated, it is argued that they are reliable. One of the arguments is that for the majority of European countries the difference between the suicide rates and the sum of suicide and undetermined intent is not significant. Our data confirm this observation (table 3), but when comparing national suicide rates with those from the ERA, six countries showed significant differences. Second, reliability has been supported by the observation that the rank order of the countries does not change substantially when adding undetermined deaths. This is confirmed partly by our data (table 4). However, taking the ERA data as a reference the rank order changes remarkably. This implies that adding (a proportion of) the undetermined intent category to correct the suicide data is possibly not a sufficient strategy for all countries to obviate the problem of underestimation. This is supported by the observation that there is no significant correlation ($r = .41$; $p = 0.13$) between the proportion of the undetermined intent for railway suicides and the degree of difference between the two sources.

How can we explain on the one hand the difference between national and ERA statistics and on the other hand cross-national differences? First, for their analysis the authors decide to exclude the X82 category from the national statistics. This category – intentional self-harm by crashing a motor vehicle – contains railway suicides while sitting in a car. However, according to specialists from Infrabel in Belgium (K. Debbaut, personal communication, October 5, 2010)

and the Finnish Transport Safety Agency (J. Karhunen, personal communication, 15 October, 2010), the number of suicides by this method is assumed to be negligible. The Rail Safety and Standards Board in the UK registered 3 cases in 2006 and 2007 (M. Clements, personal communication, October 17, 2010). The same number was found in the Netherlands (C. van Houwelingen, personal communication, October 16, 2010). Therefore, by including the X82 category, we would add mainly non railway suicides. The exclusion of the sparse cases of suicide by train while sitting in a car can only explain minor differences between the national and the ERA statistics as is the case for the Netherlands and Belgium.

A second element potentially contributing to the difference between the national and the ERA statistics is that the latter dataset includes all fatalities independent from the nationality of the deceased. The national statistical offices do not always contain detailed data on non-residents, and if so, they do not always transfer the statistical information to international statistical offices, resulting in a higher degree of discrepancy between the national mortality statistics and the ERA data. Only France, Hungary, Italy and the UK collect and transfer statistical information concerning non-residents. This should result in a smaller discrepancy between both sources. Table 2 shows that rather the opposite is true. The proportion of non-residents dying in another country on the total deaths due to external causes is estimated to be less than 9 % for the Netherlands, less than 4% for Belgium, Hungary and Sweden and less than 1% or unknown for all other countries (Belanger et al., 2008, b). Again surprisingly, the Netherlands and Belgium show a minimal discrepancy between the two sources. Moreover, Sweden is the only country for which national data are significantly higher. Besides, experts (except from the Netherlands) are convinced that that this issue of non-residents or residents committing suicide abroad, has no significant influence on the current national suicide rates (Belanger et al., 2008, a).

A third explanation could be different reporting time frames where the ERA collects data at an early point of time while the national assessments may still be in progress. Undecided cases could officially be registered as undetermined intent while railway related safety authorities can decide to classify the fatality as suicide. Later corrections are often unlikely. But even when taken the undetermined intent category into account, we find remarkable differences between both sources.

Therefore, based on our data for railway suicides, we cannot confirm our three hypotheses. First, the national suicide statistics are lower than the ERA statistics for twelve countries. For six countries, this difference is significant. Second, remarkable differences among the countries are found. Third, at least for France, Italy, the Czech Republic, Latvia and Poland, we found evidence that the national railway suicide statistics are unreliable. We argued also that the railway statistics are possibly more reliable than the overall suicide statistics, making these results even more alarming.

For an explanation of this reliability problem, we probably have to look at the registration and coding procedures of the causes of death. These registration and coding procedures differ among countries and even among regions within a country (Atkinson et al., 1975). The cross - national differences are found at all levels and phases of the registration procedure (Belanger et al., 2008,a,b; Reynders et al., 2009; Värnik et al., 2010). Officials who are authorized to perform a post mortem exam or to fill out the death certificate, differ with regard to their background, competences and the extent to which they are protected by their duty of

professional confidentiality. The minimal requirements to ascertain a suicide also vary considerably among nations and this obviously has a strong effect on the national suicide rates. For example, when applying the principle of 'beyond reasonable doubt', as is the case in the UK, instead of the 'balance of probability', the chance of an open verdict increases (O'Donnell and Farmer, 1995). Other discrepancies are found at the level of confidentiality of the death certificates' content. A lack of basic confidentiality rules can act as a threshold to officially classify the cause of death as suicide. Likewise, the information available to the statistical offices differs between countries. These differences concern the quality and the amount of information, the concepts and definitions used, the possibility to query medical or legal authorities, etc. Further, the way coders assign the ICD – codes may deviate from the guidelines proposed by the WHO (Belanger et al. 2008,b). A major determinant of the reliability of suicide rates is the number of autopsies performed. The autopsy rate differs largely among countries and among regions within a country (Waldhoer et al., 2003). Finland and Austria have a national autopsy rate of around 30%, the U.K. of 24%, Germany and the Netherlands of 8%, and Belgium of only 2% (Saukko and Pollak, 2000). Research in Scandinavian countries has shown that there is a clear relation among the autopsy rates, suicide rates and ill-defined deaths (Reseland et al., 2008). Beside these legal and technical aspects, country-specific cultural and social factors, which determine the stigma and taboo regarding suicide, are important in the process of ascertainment. Physicians, coroners and family members are therefore not always inclined to assign the label of suicide.

These differences can cause biases in national suicide statistics and even partly explain differences between national suicide rates.

Limitations

First, the findings of this study concern railway suicides and they cannot be extrapolated to all types of suicides. Second, the national suicide statistics and the ERA data are not perfectly comparable, due to different categorisations of causes of death. Third, it is difficult to determine whether the ERA data are equally or more reliable than the national data and whether they under- or overestimate the actual number of suicides. Fourth, research found a stable relation between suicide rates and undetermined death in Germany, however not for the very old (Baumert et al., 2005). In this study, we were not able to control for age. Finally, a prominent concurrent cause of death, 'undetermined or unspecified cause', was not included in the analyses. The main reason is that this category is, by its nature, not divided into specific causes like railway accidents. Although it is assumed that this category contains false negative suicides, the railway suicides are probably seldom classified in this category. The reason for this is that, in contrast to intent, the cause of death in the case of a railway fatality is clear.

Recommendations

First of all, numerous factors determine the validity and reliability of the national mortality statistics, and more specifically suicide rates. An important factor is the registration procedure applied for ascertaining causes of death. Therefore, it is advisable to aim for standardisation of the registration procedures on a European level. Second, beside primary clues (e.g. lethality of

the suicide method or a suicide note), statistical offices should be able to gain information about secondary clues (e.g. psychiatric co-morbidity, previous suicidal behaviour, psychological autopsies, etc.) in the case of death through self - inflicted injuries. Third, an efficient exchange of information resulting from additional post-mortem inquiries between legal authorities and statistical offices is indispensable.

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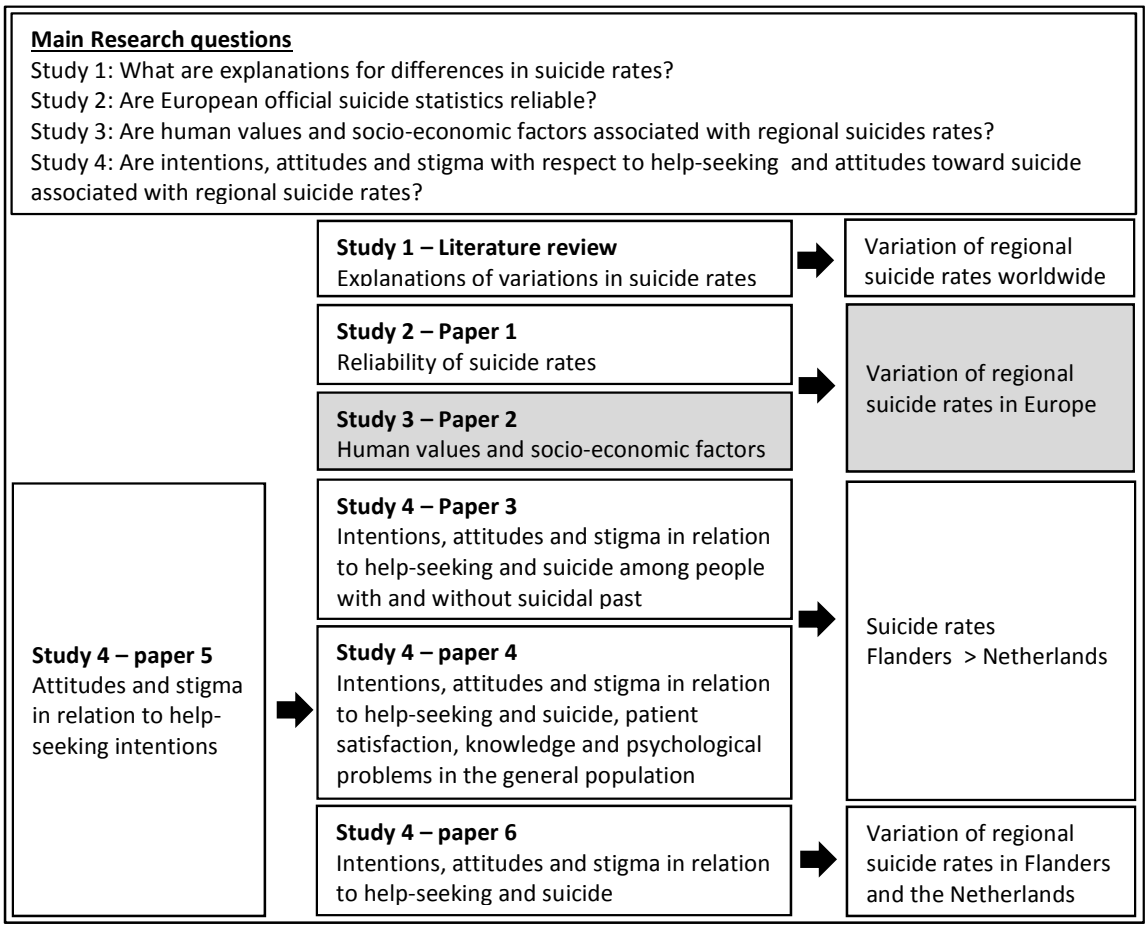
STUDY 3 - Paper 2: Human values, socio-economic factors and suicide rates



Human values and socio-economic variables in relation to suicide. A longitudinal analysis of regional suicide rates in 11 European countries.

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Abstract

Background: Suicide rates vary between and within countries.
*Aim*s: Investigating the association between regional suicide rates and Schwarz's human values controlling for socio-economic variables.
Method: The dependent variables were suicide rates and the rate of self-harm of which the intent was undetermined. The socio-economic variables were religiousness, unemployment, education, fertility, social contact and social capital. Data were collected from the European Social Survey and Eurostat. Data were gathered for 87 regions of 11 European countries and analyzed by means of descriptive statistics, correlations and longitudinal analysis for period 2005-2010.
Results: The human value dimension Autonomy vs. Embeddedness was the single consistent predictor of regional suicide rates. In Regions where people gave more priority to values reflecting autonomy, suicide rates were lower in the years following.
Limitations: We were restricted to those countries and variables for which data were available.
Conclusions: The value Autonomy seems to have a protective effect toward suicide at the regional level, after controlling for socio-economic variables.
Keywords: longitudinal analysis, socio-economic factors, cultural dimensions, regional suicide rates.

INTRODUCTION

Although suicide seems to be an individual act, studies have shown that suicide rates can vary substantially between and within countries (Korosec Jagodic, Agius, & Pregelj, 2012). In explaining these differences between suicide rates, the majority of studies are inspired by the social integration theory of Durkheim. Already in the late 1800's, Durkheim argued that modern societies are characterized by social disintegration and deregulation. This results in high levels of Individualism and anomie which caused suicide rates to increase (Durkheim, 1951). Social integration contains different dimensions such as economic and religious integration and social fragmentation. Until today, these dimensions are often operationalized in terms of unemployment rates, secularization, fertility rates, educational attainment, social capital, etc. Although many studies have found associations between these societal indices and regional or national suicide rates, only few studies have investigated the cultural values underlying Durkheims' theory (Lenzi, Colucci, & Minas, 2012) and none have done so in a longitudinal design.

Schwartz' value dimensions

Schwarz defined human values as beliefs that refer to desirable goals beyond specific actions and situations and which serve, according to their relative importance, as standards for action (Schwarz, 2012). human values evolve to recognize, respond and cope with societal problems. Schwarz distinguished three cultural value orientations on which cultures can be described. (Schwarz, 2006).

The first orientation is Autonomy versus Embeddedness. This refers to how people should fill in the relation between the individual and the group. Higher scores on Autonomy versus Embeddedness accord with lower levels of Durkheims' social integration**.** In autonomous cultures, people should cultivate and express their own preferences, feelings, ideas, and abilities, and find meaning in their own uniqueness. In embedded cultures, meaning of life comes through social relations, identification with the group, and meeting with shared goals. Embedded cultures emphasize maintaining the traditional order.

The second dimension, Egalitarianism versus Hierarchy concerns the way people should behave to maintain society. Cultural egalitarianism encourages people, who are each other's moral equals, to do so by being responsible and helpful to others. In hierarchal cultures, power, roles, and resources are unequally distributed and taken for granted. This dimension is related to social regulation.

The third dimension is Harmony versus Mastery and regulates the relation of people to the natural and social world. In harmonic cultures it is important to have a symbiotic relation with the environment and nature without the intention to manipulate or exploit it. Mastery is the opposite cultural response. Here, people are expected to master, direct, and change the environment to realize their goals. Being ambitious, taking initiative, and daring are important values. These are the value dimensions we use in our analyses.

Schwartz' value dimensions show overlap with two other prominent indexes of culture: those of Hofstede (2001) and Inglehart (2000). Schwartz' Autonomy ($r = 0.54$) and Egalitarianism ($r = 0.51$) correlate positively and conservatism correlate negatively ($r = -0.56$) with Hofstede's Individualism (i.e. the level of feeling autonomous and of feeling independent

from family and other social groups) (Schwartz, 1994). Schwartz' Autonomy versus Embeddedness has a strong negative correlation (r = -0.82) with Inglehart's Survival versus Self-expressionism (Dobewall & Strack, 2014). People who emphasize Self-expressionism are tolerant toward minorities and out-groups, participate in society and politics and have trust in others. Survival refers to the opposite values. Schwartz' Autonomy versus Embeddedness also had a moderate negative correlation with Traditional versus Secular-rational values. Traditional societies emphasize religious beliefs and male dominance in economic and political life. In contrast, secular-rational societies stress the importance of rational organization, achievement and secularization.

Cultural values and suicide

Research on the association between culture and cross-national suicide rates found that Hofstede's Individualism was positively associated with suicide rates (Rudmin et al., 2003). The same conclusion was drawn from an analysis of youth suicide mainly in developed countries (Eckersley & Dear, 2002). Here it was argued that Individualism undermines social integration, consistent with Durkheim (1951). Based on analyses of Individualism/Autonomy indexes from Hofstede, Inglehart and Schwartz, Lenzi et al. (2012) also found a positive association with suicide rates worldwide. However, when only including post-traditional countries, Individualism was *negatively* correlated with suicide rates. Similarly, Allik and Realo (1997) found that countries with high levels of individualism have lower suicide rates than countries with moderate levels of individualism. Allik and Realo (1997) also found that Mastery (Schwarz) was positively correlated with suicide rates.

Regarding other value dimensions, the acceptance of Power distance (Hofstede) was negatively correlated with suicide (Allik & Realo, 1997). Rudmin et al. (2003) explained this by suggesting that the security of rigid social norms which is typical for Power distance, works as a buffer for suicide. Research using Hofstede's cultural values did not find any robust relations with suicide rates worldwide (Lester, 2005) or in post-traditional countries (Lenzi et al., 2012). Inglehart's Traditional versus secular-rational was positively and Survival versus Self-expressionism negatively correlated with suicide rates in post-traditional countries (Lenzi, Colucci, & Minas, 2012). In the same study, only Egalitarianism correlated negatively with suicide rates.

The present research

There are a number of important limitations to these studies on cultural values and suicide rates. First, most of the above mentioned studies analyzed nations across continents. This means that cultural measures are assumed to have the same meaning and effect on suicide without taking into account the broader (e.g. continental) cultural context. It has therefore been argued that comparing more similar countries is more productive because it allows to highlight more specific aspects of dissimilarity (Eckersley & Dear, 2002). Second, most studies compare culture on the national level. Although valuable, these study designs do not capture the cultural variations and variations between suicide rates within countries. Indeed, an analysis of cultural values in 30 European countries found evidence of intra-national cultural diversity (Koster, 2013). Third, most studies included no or a limited number of socio-economic variables into the analysis. Fourth, none of the studies took the most important concurrent cause of death of

suicide into account, i.e., deaths of which the intention is undetermined. Finally and most importantly, the studies discussed above have a cross-sectional study design making them vulnerable for unobserved biases typical for ecological studies. As a result they cannot draw strong conclusions about causality.

With this study, we want to avoid these shortcomings. The aim of this study is to investigate the effect of Schwartz's value dimensions on suicide rates at a regional level by estimating a single growth model. This is the first longitudinal study of human values and suicide rates. Indicators of social integration were included in the analysis to determine the strength of the associations between suicide rates and Schwartz' human value dimensions over and above known correlates of suicide rates. Furthermore, to forestall the bias caused by misclassified suicides, we decide to include the most important concurrent cause of death category 'self-harm of which the intent is undetermined' (UI) into the analysis (Reynders, Scheerder, & Van Audenhove, 2010). More specifically, we analyzed the 87 regions of 11 European countries. Based on the above literature review for cross-sectional relations, we can tentatively predict a negative effect of Autonomy and a positive effect of Mastery on suicide rates. However, it is of course possible that cross-sectional relations turn out to be different from longitudinal relations.

METHOD

For this study we gathered data for 11 European countries and their 107 NUTS level 1 or 2 regions. These countries are: Belgium, France, Germany, Hungary, the Netherlands, Norway, Poland, Portugal, Spain, Sweden and Switzerland. The selection of countries was determined by the availability of the data at the same regional level provided by the two data sources. The first data source was Eurostat (2014) and the second source was the European Social Survey (ESS, 2006, 2008, 2010). ESS is a cross-national survey that has been conducted every two years since 2001. The survey measures attitudes, beliefs and behavior patterns in more than 30 countries. For the 11 countries included in this analysis, ESS generated information about more than 62,000 respondents. Although we conducted analyses including all regions we only reported here the results of the analysis of the regions with more than 60 respondents. As a result, 20 regions were excluded from the analyses.

Dependent variables

The dependent variables are the suicide rates per 100,000 habitants (SUI) of 107 NUTS 1 or 2 - regions of 11 European countries. These data were gathered from the Eurostat Regional statistics (Eurostat, 2014). Means for the years 2005-'06 (T1), 2007-'08 (T2) en 2009-'10 (T3) were calculated. Furthermore, we calculated for the same regions the sum of the suicide rates and the deaths of which the intent of the self-inflicted harm is undetermined (UI). The reason for this is that UI is the main cause of death category in which unidentified or misclassified suicides are subsumed. The extent of this undetermined intent category differs between countries. This is caused by different national certifying procedures. It is argued that this category could partially explain differences in suicide rates. Therefore, it is advisable to, if possible, include these data into the analysis. A large part of the variance in regional suicide rates is due to differences between countries. Between 61 and 74 percent of the between-region

variance in suicide rates is due to the fact that regions belong to different countries. We will therefore control for country in the multivariate analyses (see below).

Independent variables

For each of the 107 regions we gathered the following data from the Eurostat- Regional statistics for the years 2006 (T1), 2008 (T2) en 2010 (T3) (Eurostat, 2014):

Unemployment rate of the active age population expressed in percentages. Unemployment was often found to be the strongest predictors of elevated suicide rates between and within countries (Rehkopf & Buka, 2006).

Education: the percentage of people with low education attainment i.e. less than secondary school. Regional or national levels of educational attainment was in some studies negatively (Desaulniers & Daigle, 2008; Rehkopf & Buka, 2006), and in others positively (Page, Morrell, Taylor, Carter, & Dudley, 2006; Vijayakumar, Nagaraj, Pirkis, & Whiteford, 2005) associated with suicide rates.

Fertility: the number of children per woman. Studies comparing nations worldwide did find a negative association between birth rates and suicide rates (Milner et al., 2012, Neumayer, 2003).

For each of the 107 regions we gathered from the European Social Survey the following data for the year 2006 (T1), 2008 (T2) en 2010 (T3) (ESS, 2006, 2008, 2010):

Religiousness: average score on the item 'How religious are you?' on a 11 point scale for which 0 indicates 'not at all religious' and 10 'very religious'. The association between religiousness and suicide is also less unequivocal. While some studies found a positive association (Balint, Dome, Daroczi, Gonda, & Rihmer, 2014; Cutright & Fernquist, 2004; van Tubergen, te Grotenhuis, & Ultee, 2005) others found no association (Hooghe & Vanhoutte, 2011; Neumayer, 2003) between religion and suicide rates. It was argued that in more secularized societies, the effect of religion on suicide diminishes.

Social capital: average score on the item 'Most people can be trusted or you can't be too careful' on a 11 point scale for which 0 means 'you can't be too careful' and 10 'most people can be trusted'. Closely related to social fragmentation is the concept of social capital. Social capital refers to voluntary relations and networks based on trust which contribute to positive social action (Kelly, Davoren, Mhaolain, Breen, & Casey, 2009). Social capital, often measured by the level of trust in others, is therefore assumed to be a protective factor of suicide. This assumption was confirmed by different cross-national (Bezo, Maggi, & Roberts, 2012; Cutlip, Bankston, & Lee, 2010; Helliwell, 2006; Kelly et al., 2009), as well as by intra-national studies (Congdon, 2012; Kunst, van Hooijdonk, Droomers, & Mackenbach, 2013; Okamoto, Kawakami, Kido, & Sakurai, 2013).

Social contact was measured by the percentage of people who answered at least 'once a week' to the following question: ' How often do you socially meet with friends, relatives or colleagues?'

Being part of a social network increases the feeling of belongingness which is assumed to be a protective factor of suicide (Joiner et al., 2009) Furthermore, social support is believed to be a protective factor of suicide because it implies that people can count on others when coping with stressful events or psychological problems (Kleiman & Liu, 2013). Nevertheless, to our

knowledge the association of social networks at a regional level and suicide rates is never been investigated.

Human values were measured by the 21 item European Social Survey Human values scale (see below for the items and dimensions). This scale is adopted from Schwartz's Portrait Values Questionnaire (Schwartz, 2003). The participants were offered a description of a person who holds a certain value. Next, the participants were asked to what extent that they support that value. The responses ranged from 'very much like me' to 'not like me at all' on a six-point scale. The 21 items were designed to classify people according to their value orientations. The items can be grouped into six human value dimensions and three polar value dimensions (Schwarz, 2006). According to Schwarz (2012) the scale should measure people's value priorities, i.e. the relative importance of different human value dimensions. The six human value dimensions are calculated by averaging the items included in each culture value. To eliminate individual differences in the use of the response scale and hence measure the priorities accurately, the mean response across all items is subtracted from the response of each individual item. Next, to compute the three polar value dimensions, the score from the second pole is subtracted from the first pole, e.g. Autonomy minus Embeddedness. In order to investigate the extent to which regions and countries differ in their average scores on human value dimensions, we estimated a multilevel 'null model' or 'empty model' with three levels: individual, region, and country. Of the total variance in human value dimension scores (Autonomy versus Embeddedness, Harmony versus Mastery, and Egalitarianism versus Hierarchy), about two percent is due to value differences between regions and 5-10 percent is due to value differences between countries, the rest being at the individual level. So, there is enough between-region variance in values to meaningfully create region-level values scores. Therefore, the scores for the three polar value dimensions are averaged at the regional level.

Dimension 1: Autonomy versus Embeddedness:

Intellectual and affective Autonomy

8. It is important to him to listen to people who are different from him. Even when he disagrees with them, he still wants to understand them.

1. Thinking up new ideas and being creative is important to him. He likes to do things in his own original way.

11. It is important to him to make his own decisions about what he does. He likes to be free to plan and to choose his activities for himself.

6. He likes surprises and is always looking for new things to do. He thinks it is important to do lots of different things in life.

10. Having a good time is important to him. He likes to "spoil" himself.

21. He seeks every chance he can to have fun. It is important to him to do things that give him pleasure.

Embeddedness

5. It is important to him to live in secure surroundings. He avoids anything that might endanger his safety.

14. It is very important to him that his country be safe from threats from within and without. He is concerned that social order be protected.

7. He believes that people should do what they're told. He thinks people should follow

rules at all times, even when no-one is watching.

16. It is important to him always to behave properly. He wants to avoid doing anything people would say is wrong.

9. He thinks it's important not to ask for more than what you have. He believes that people should be satisfied with what they have.

20. Religious belief is important to him. He tries hard to do what his religion requires.

Dimension 2: Harmony versus Mastery

Harmony

19. He strongly believes that people should care for nature. Looking after the environment is important to him.

Mastery

15. He looks for adventures and likes to take risks. He wants to have an exciting life.

4. It is very important to him to show his abilities. He wants people to admire what he does.

13. Being very successful is important to him. He likes to impress other people.

Dimension 3: Egalitarianism versus Hierarchy

Egalitarianism

12. It's very important to him to help the people around him. He wants to care for other people.

18. It is important to him to be loyal to his friends. He wants to devote himself to people close to him.

3. He thinks it is important that every person in the world be treated equally. He wants justice for everybody, even for people he doesn't know.

Hierarchy

2. It is important to him to be rich. He wants to have a lot of money and expensive things.

17. It is important to him to be in charge and tell others what to do. He wants people to do what he says.

Analysis

First, mean, minimum and maximum values for the dependent variables at the regional level within each country are presented (Table 1). For the multivariate analyses, we only included those regions for which there were at least 60 respondents in the ESS. As a result 20 regions were excluded from the analyses. In a series of preliminary analyses, we estimated models where the culture variables and control variables are lagged by 2 and 4 years. For example, in one model T3 suicide is predicted by T2 suicide and T2 scores for the human values and all socio-economic control variables. In the corresponding reverse models, T3 human values are predicted by T2 values, suicide and control variables. Such cross-lagged analyses can establish whether a relation between human values and suicide is likely driven by a causal effect of values on suicide, suicide on values, or both (Finkel, 1995). These models were run using multilevel regression, which allowed us to control for the nesting of regions in countries. This is necessary to adjust for the non-independence of regions of the same country and thus to protect against inflated type I errors (Kuppens & Pollet, 2014; 2015). In our multilevel models we do not add predictors at the country level; coefficients for the region-level predictors therefore reflect a

mix of region-level and country-level relations (Snijders & Bosker, 2012). In other words, we report on relations between regions in European countries, not just between regions of the same country. Both region-level and country-level relations are consistent with approaches such as Durkheim's (1951) so we saw no need to disentangle both levels. There were 12 models with suicide as the dependent variable: four suicide rates multiplied three time comparisons. There were 36 models with one of the human values as the dependent variable (three times as much as for suicide because there are three values).

Next, we estimated a single growth model using multilevel modeling (Singer & Willett, 2003) in which variables measured at T1 predicted the change in suicide from T1 to T2 and T3. In this multilevel model the suicide rates for T1 to T2 and T3 were nested within regions, and regions were nested within countries. The model included (1) a linear effect of time, which was coded with values 0, 1, and 2, (2) a quadratic effect of time, (3) a random intercept for region, that is, a region-specific deviation from the overall mean suicide rate, (4) a random slope for time, that is, a region-specific deviation from the change in suicide rate over time, (5) a random intercept for country, that is, a country-specific deviation from the overall suicide rate, to control for the non-independence of regions from the same country, and (6) the 2006 scores of all predictors. The latter estimate the effect of all predictors on T1 values for suicide. Crucially, however, we also added (7) the interactions between time and all predictors, testing whether the 2006 score on a particular predictor was related to the (linear) change in suicide from T1 to T2 and T3.

In all models, continuous predictors were rescaled to cover the range of 0-1 so that unstandardized coefficients represent the proportional change in the outcome variable associated with a change in the predictor variable from the lowest to the highest value.

RESULTS

Descriptive results

Table 1 shows the spread within and between countries with respect to SUI and SUI+UI T3. The difference between the highest and lowest SUI for men is about 50 suicides per 100,000 inhabitants for men and 15 suicides for women. The within-country spread is on average 14.7 suicides for men and 4.1 for women. We notice that some countries deviate markedly from this average. For example, France, Hungary and Portugal have a spread that is about twice as high. The average regional difference between SUI and SUI+UI is 3.1 and 2.7 for men and women respectively. Here too, we observe for example that Poland and Portugal have differences between SUI and SUI+UI which are at least twice as high as the regional average. Compared to the suicide rates T1, we noticed a decrease of the suicide rates in T3 in Belgium and Switzerland and a increase in in Poland and Portugal among men. Female suicide rates decreased in Sweden and Switzerland. For all other countries, differences between the two points in time were less than 1/100,000 inhabitants.

Table 1 SUI and SUI + UI per 100,000 inhabitants at the regional level (N=107) for each of the 11 countries.

	Male					Female				
	T3				Difference	T3				Difference
	Average	Min.	Max.	Sui+Ui	with T1	Average	Min.	Max.	Sui+Ui	with T1
Belgium (N=3)	25.3	16.5	34.0	30.0	-2.1	9.7	8.3	11.3	11.2	-0.8
France (N=8)	26.2	11.5	35.3	27.2	-0.6	8.1	4.6	11.6	8.3	-0.4
Germany (N=16)	18.8	13.7	23.8	23.1	0.0	6.0	4.7	7.9	8.2	-0.5
Hungary (N=7)	40.6	28.1	53.3	42.2	-0.7	10.2	6.3	15.2	11.4	-0.7
Netherlands (N= 12)	13.7	10.4	17.5	14.0	0.1	5.6	3.9	6.7	5.7	-0.2
Norway (N=7)	16.9	13.7	23.1	16.9	0.6	6.4	4.7	8.1	6.4	-0.4
Poland (N=16)	30.9	21.0	38.3	37.2	3.5	4.6	3.1	6.7	10.0	0.2
Portugal (N=5)	21.8	8.2	42.0	33.0	2.9	6.0	2.4	11.1	17.0	0.4
Spain (N=18)	11.8	3.4	19.9	11.9	-0.3	3.2	0.5	5.9	3.3	-0.2
Sweden (N=8)	19.3	15.1	25.9	22.7	0.5	7.0	6.0	8.4	10.2	-1.5
Switzerland (N=7)	19.3	13.6	23.9	20.2	-4.1	6.8	5.2	7.9	7.5	-3.9

Table 2 Regional suicide rates predicted by human values measured 2 or 4 years earlier

	T1-T2		T2-T3		T2-T3	
	B	p	B	p	B	p
Men						
Autonomy vs embeddedness	-0.05	0.18	**-0.12**	**0.03**	**-0.24**	**<.001**
Egalitarianism vs hierarchy	-0.04	0.28	-0.01	0.90	-0.10	0.12
Harmony vs mastery	**0.08**	**0.02**	-0.02	0.80	0.08	0.16
Men (including ui)						
Autonomy vs embeddedness	-0.03	0.45	-0.12	0.06	**-0.21**	**0.02**
Egalitarianism vs hierarchy	**-0.13**	**0.02**	-0.02	0.78	-0.11	0.23
Harmony vs mastery	**0.10**	**0.03**	0.08	0.18	0.10	0.17
Women						
Autonomy vs embeddedness	-0.12	0.19	-0.02	0.79	**-0.26**	**<0.01**
Egalitarianism vs hierarchy	-0.03	0.76	0.10	0.19	-0.06	0.51
Harmony vs mastery	0.02	0.80	0.14	0.10	0.05	0.54
Women (including ui)						
Autonomy vs embeddedness	**-0.13**	**0.05**	-0.06	0.60	**-0.26**	**0.04**
Egalitarianism vs hierarchy	-0.003	0.96	-0.09	0.39	-0.15	0.21
Harmony vs mastery	-0.05	0.38	**0.28**	**0.01**	-0.004	0.97

Significant coefficients (p < .05) in bold. Coefficients represent the proportional change in suicide corresponding to a change from the lowest to the highest regional average for a particular value.

Cross-lagged analyses

Next, we investigated whether regional cultural dimensions at one point in time predict regional suicide rates at a later point in time. Out of the three values, *Autonomy versus Embeddedness* was the most consistent predictor of suicide: all coefficients were negative and they reached statistical significance in six out of twelve models (see Table 2). One notable aspect of these results is that for the analysis of the 4-year lag (i.e., T1 values predicting T3 suicide) the effect of Autonomy versus Embeddedness was remarkably strong, compared to the models where values were lagged by only 2 years. *Harmony versus Mastery* showed a significant positive coefficient in three out of twelve models. For men, for example, a change from the lowest to the highest value for Harmony versus Mastery in T1 predicts an increase of 8 to 10 percent of the suicide rates in T2. *Egalitarianism versus Hierarchy* only had a significant negative effect in one model, so we should not attach too much importance to this result.

When suicide was lagged instead (e.g. T3 human values are predicted by T1 or T2 suicide), it significantly predicted values only once out of 36 models tested. These results therefore suggest that human values (especially Autonomy versus Embeddedness but also Harmony versus Mastery) cause changes in suicide rather than the other way around. Of the socio-economic control variables, only social capital had more than one significant effect in the same direction: it negatively predicted suicide in three models and had a consistently negative coefficient in all models.

Multilevel growth model

However, values did not predict suicide consistently in every single model of Table 2. Results depended somewhat on gender, and the specific time comparison that was made. We therefore decided to estimate a single growth model using multilevel modeling (Singer & Willett, 2003) in which variables measured in T1 predicted the change in suicide from T1 to T2 and T3. Tables 3 and 4 present the effects of all predictors on the change in suicide for men and women, respectively. One effect stands out: regions with higher values for Autonomy versus embeddedness at T1 saw a relatively larger decrease in male and female suicide rates in T2 and T3, compared to regions with lower values for autonomy versus embeddedness at T1. For example, a change from the lowest to the highest regional level of Autonomy at T1 corresponds with an 11 percent lower suicide rate in T2. In other words, at the regional level Autonomy appears to be a protective factor for suicide. No other variable had a consistently significant effect on the change in suicide although low education predicted an increase in suicide for women in the models where human values were not included as predictors.

The largest Variance Inflation Factor (VIF) in the model was 4.26 (for social capital) and the largest VIF for any of the human values was 3.11. These values for VIF do not point to problematic multicollinearity. We presented analyses only for those regions for which there were at least 60 respondents in the ESS, but analyses including all 107 regions led to very similar results.

Table 3 Human values and socio-economic variables predict change in regional suicide rates for men from 2006 to 2008 and 2010 (multilevel growth model, N = 87 regions[a])

Model	Suicide men				Suicide + UI men			
	1		2		1		2	
	B	p	B	p	B	p	B	p
Unemployment	0.04	0.20	-0.01	0.86	-0.01	0.84	-0.03	0.40
Low education	0.02	0.41	-0.02	0.36	0.03	0.30	0.01	0.78
Fertility	0.01	0.66	0.03	0.06	0.02	0.38	0.02	0.30
Religiousness	0.02	0.20	-0.03	0.09	-0.00	0.93	-0.03	0.31
Social contact	-0.01	0.75	0.02	0.41	-0.02	0.62	-0.01	0.82
Social capital	-0.01	0.82	-0.03	0.26	0.003	0.94	-0.01	0.83
Autonomy vs. Embeddedness			**-0.11**	**< .001**			-0.07	0.05
Egalitarianism vs. Hierarchy			-0.04	0.23			0.02	0.70
Harmony vs. Mastery			0.01	0.83			-0.01	0.78

[a] Only regions with more than 60 participants in the ESS data set
Significant coefficients (p < .05) in bold

Table 4 Human values and socio-economic variables predict change in regional suicide rates for women from 2006 to 2008 and 2010 (multilevel growth model, N = 87 regions[a])

Model	Suicide women				Suicide + UI women			
	1		2		1		2	
	B	p	B	p	B	p	B	p
Unemployment	0.09	0.06	0.01	0.78	0.07	0.21	-0.02	0.73
Low education	**0.08**	**0.03**	0.03	0.45	**0.11**	**0.02**	0.05	0.25
Fertility	0.01	0.69	0.03	0.20	0.02	0.44	**0.06**	**0.05**
Religiousness	-0.01	0.82	**-0.09**	**0.01**	**0.09**	**0.01**	-0.01	0.71
Social contact	-0.04	0.27	-0.01	0.81	-0.07	0.15	-0.02	0.63
Social capital	0.01	0.80	-0.03	0.46	-0.01	0.91	-0.07	0.19
Autonomy vs. Embeddedness			**-0.16**	**< .001**			**-0.18**	**< .001**
Egalitarianism vs. Hierarchy			-0.01	0.82			-0.06	0.30
Harmony vs. Mastery			-0.04	0.31			-0.04	0.25

[a] Only regions with more than 60 participants in the ESS data set
Significant coefficients (p < .05) in bold

DISCUSSION

The goal of this study was to investigate if Schwartz's cultural values, adjusted for socio-economic indicators, could predict changes over time in regional suicide rates of 11 European countries. The descriptive statistics confirmed our assumption that there is variance of the suicide rates not only between but also within countries. The effects of cultural values suggest that one can indeed study suicide meaningfully at the regional level.

Specifically, Autonomy versus Embeddedness, often used as an indicator of social disintegration, was negatively associated with suicide for men and women. Thus, in regions where people are more open toward new ideas, make their own decisions and seek to enjoy life, suicide rates are lower than in regions where people found it more important to live in secure environments, to identify with the social group, to confirm the norms, to be modest and to be religious. This result is opposite to what to expect based on Durkheim's insights where social integration is a protective factor of suicide. However, as discussed previously, Autonomy is positively associated with Hofstede's Individualism and Inglehart's Self-expression and Secular-rational values. Lenzi et al. (2012) found that Self-expression and Secular-rational values were negatively associated with suicide rates in non-traditional countries. Furthermore, Allik and Realo (1997) found that in the most individualistic countries, suicide rates were lower than in other countries. What then could explain the protective effect of Autonomy values with respect to suicide rates in non-traditional or individualistic countries? Lenzi et al. (2012) argue that in modern societies, were people become increasingly free to choose their own identity and social roles, giving priority to values such as being adventurous, taking risks, develop abilities etc. increases the possibilities for people to become more socially integrated. Furthermore, the pursuit of personal goals and needs as an important value, is related to a more individualistic culture in which personal control or internal locus of control is more prevalent (Stocks, April, & Lynton, 2012). Research found that nations with higher levels of internal locus had lower suicide rates (Lester, Castromayor, & Içli, 1991). Thus, in contemporary Europe, people are assumed to form their own identity and take their own social position. Values that are in line with increasingly Individualistic countries, therefore have a positive influence on social regulation and integration in post-modern societies.

Harmony versus Mastery and Egalitarianism versus Hierarchy, as an indicator of social regulation, were not found to be associated with a subsequent increase in suicide. However, we did find that Harmony vs. mastery at T1 was positively associated with regional suicide rates for men at T2. This is consistent with previous research (Allik & Realo, 1997). Referring to the negative association between Autonomy and suicide, this is not a total surprise. As is the case with Autonomy, Mastery is also associated with individualism. Mastery is about giving preference to controlling the environment and the social context rather than live in harmony with the environment. This too could be interpreted as useful adaptation toward an individualizing society. However, this is not associated with a cultural preference of being in charge over other people and rigid hierarchical interaction styles as showed by the negative association between Egalitarianism and regional suicide rate at T1 to T2 among men. In sum, the relations we found between Autonomy (versus Embeddedness) and Harmony (versus

Mastery) on the one hand, and suicide rates on the other hand, are consistent with previous findings in the literature.

Surprisingly, socio-economic variables had no robust effects in our longitudinal models, and this finding raises doubts about causal interpretations of previous cross-sectional analyses. While research has frequently found that unemployment rate is positively associated with regional suicide rates, this relation was not observed in our longitudinal study. In other words, despite the 2008 economic crisis, no effect of unemployment on regional suicide rates was found. Social contact and social capital neither predict suicide rates in any of the four models. In regions with higher proportions of low educated people, suicide rates tend to be higher among women, but this effect diminishes after including the Human Values into the model. Higher fertility rates predict only higher regional suicide rates among women. Although not consistently, this finding contradicts the assumption that familial integration in terms of fertility, is a protective factor of suicide on a regional level. Overall, we can conclude that socio-economic variables have no predictive effect on male suicide rates and only a limited and inconsistent effect on female suicide rates. This suggests that associations found by previous, mainly cross-sectional studies, should probably not be interpreted as causal relations.

Limitations

Some limitations should be taken into consideration. First, although 107 regions of 11 countries were included in the analysis, we were restricted to those countries for which data were available. Furthermore, we only could take those variables into consideration for which data were available at the regional level. For example, indicators of poverty or inequality could not be taken into account. Second, one could argue that in a diversifying Europe, it is no longer possible to think in terms of national or regional cultural units. Indeed, countries and even regions are not homogenous units. However, analyses conducted by Schwarz among different subgroups showed that there is still evidence for a cultural unity at a national level but also that it is important that samples from different countries are matched. However regional level analysis are preferred above national level comparisons. It was found that there is an association between regional level values and individual level values and that regional level diversity has a stronger impact on individual preferences and attitudes than national diversity. Therefore, it is proposed to use regional level analysis across countries as we did in this study (Koster, 2013; van Herk & Poortinga, 2012). Furthermore, of the total variance in human values scores (Autonomy versus Embeddedness, Harmony versus Mastery, and Egalitarianism versus Hierarchy) in our study, about two percent is due to value differences between regions and 5-10 percent is due to value differences between countries, the rest being at the individual level. So, there is enough between-region variance in values to meaningfully create region-level value scores.

Third, one issue that is not clear is the lag at which human values predict suicide. When investigating a lag of two years, there was some support for a negative effect of Autonomy versus Embeddedness and also for a positive effect of Harmony versus Mastery on male suicide rates. However, when investigating a four-year lag, the negative effect of Autonomy versus Embeddedness was the only effect that was reliable. It is difficult to draw strong conclusions regarding the timescale at which the effects occur; more data on longer time periods will be needed to illuminate this issue.

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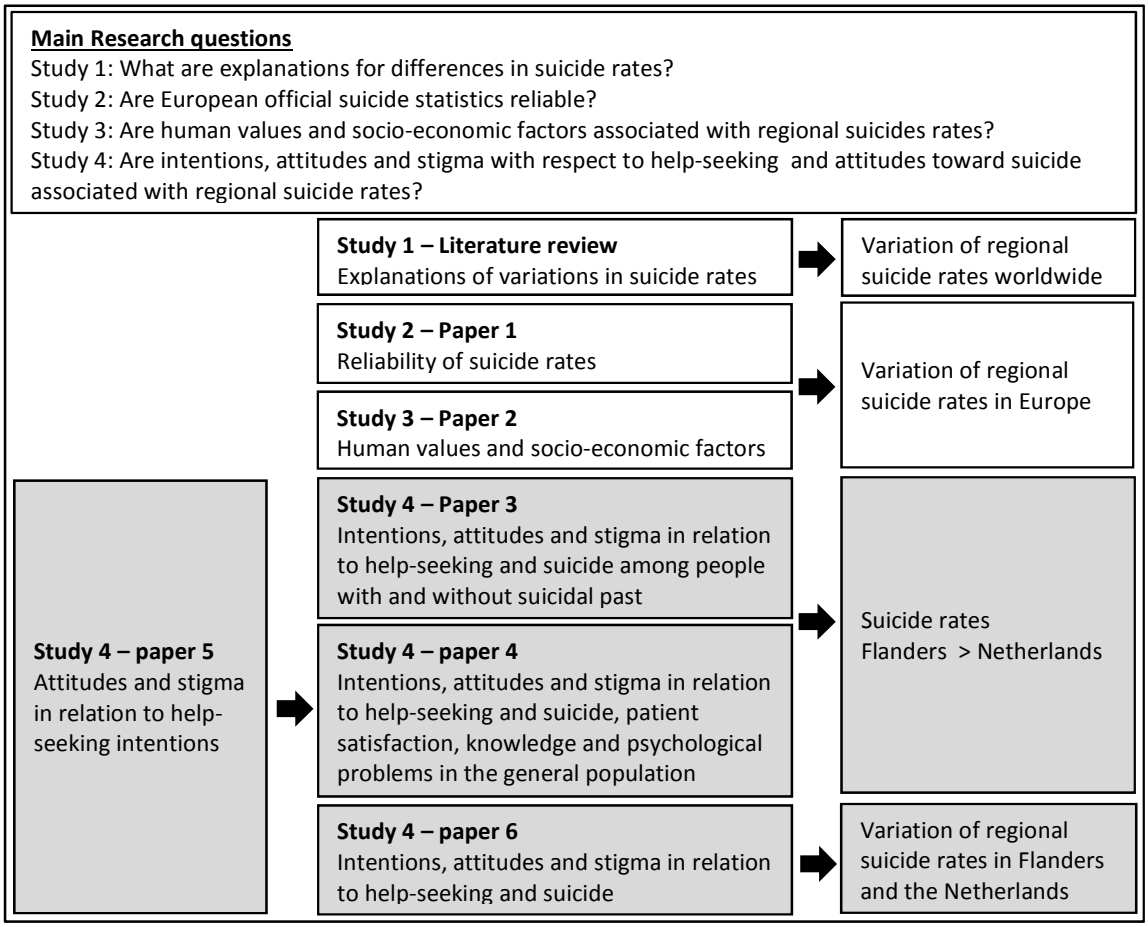
STUDY 4 - Papers 3 - 6: Socio-cognitive factors in relation to help-seeking and suicide



Introduction

Our literature review (Study1) shows that the regional variability of suicide rates received much attention in the scientific literature. We also notice however that certain potential determinants remained underexposed. Explanatory models concerning high rural suicide rates emphasized the importance of intentions, attitudes and stigma in relation to help-seeking for psychological problems. These socio-cognitive factors can be an important barrier for people to seek psychological help. Not receiving help for psychological problems can cause these problems to aggravate and hereby increasing the risk of suicidal thoughts and behavior.

Furthermore, we ascertain that suicidal persons more often have positive attitudes toward suicides. However, this strong association on an individual level is less clear on the level of regions. Two studies found that countries characterized by more approving attitudes toward suicide among its population, had higher suicide rates (Cutright & Fernquist, 2004; Stack & Kposowa, 2008), while two other studies came to opposite conclusions (Platt, 1989; Renberg et al., 2008).

These socio-cognitive factors are not merely individual traits but also collective traits, because they are influenced by cultural factors. This means that these socio-cognitive factors can vary between countries and even between regions within a country.

These findings bring us to the fourth main research question: Are intentions, attitudes and stigma with respect to help-seeking and attitudes toward suicide associated with regional suicide rates?

With Study 4, we aim at contributing to this discussion. First, we elaborate on the theoretical and conceptual framework of the socio-cognitive factors and their relation with help-seeking and suicide. Second, we describe the sub-research questions and the research design. Next, we present the four papers in which we investigate these research questions.

1. Theoretical and conceptual framework

In this section, first we define attitudes toward help-seeking and intentions to seek help for psychological problems. Second, we discuss different dimensions of the concept of stigma and their interrelationship with attitudes and intentions. Third, we approach attitudes and stigma within a cultural context. Fourth, we describe how attitudes and stigma can be related to suicide.

1.1. Intentions and attitudes

According to the Theory of Planned Behavior, an intention is the readiness to perform a behavior and it is assumed to be the immediate antecedent of behavior (Ajzen, 1991). An important predictor of behavioral intentions are the attitudes toward behavior. An attitude toward a behavior is the degree to which the consequences of this behavior are judged as positive or negative in a given situation (Ajzen, 1991). All other things equal, a positive attitude toward a behavior increases the chance that someone will act in line with that attitude. Different studies show that positive attitudes toward psychological help-seeking are positively associated with the intention to seek help (Bathje & Pryor, 2011; Schomerus & Angermeyer, 2008; Vogel, Wade, & Hackler, 2007) and with actual help-seeking behavior (Komiti, Judd, & jackson, 2006; ten Have, de Graaf, Ormel, & Vilagut, 2010).

Attitudes toward psychological help-seeking do not merely determine if someone would seek help. They are also associated with treatment preference, provider choice (Angermeyer & Dietrich, 2006; Riedel-Heller, Matschinger, & Angermeyer, 2005) and the perceived need for help (Prins, Verhaak, van der Meer, Penninx, & Bensing, 2009; Van Voorhees et al., 2006). For example, a negative attitude toward help-seeking for depression is related to a preference for a general practitioner above specialized mental health care providers (Van Voorhees, Cooper, & Rost, 2003). A possible explanation for this is that seeking help with a general practitioner is experienced as less stigmatizing than seeking help with a psychologist of psychiatrist (Barney, Griffiths, Jorm, & Christensen, 2006). This observation suggests that not only someone's own attitudes but also the attitudes of others influence behavior. According to the Theory of Planned Behavior, help-seeking intentions are not only determined by attitudes, but also by subjective norms (Ajzen, 1991). The subjective norm contains the perceived social pressure and expectations of important others. People have a tendency to adapt their behavior and conform to this subjective norms. These social norms are connected to the concept of stigma.

1.2. Stigma, perceived stigma and self-stigma

Erving Goffman, one of the most influential sociologists with respect to the theory of stigmatization defined stigma as: "*an attribute that is deeply discrediting and that reduces the bearer from a whole and usual person to a tainted, discounted one*" (Goffman1963, p. 3). Since Goffman's contribution, many definitions, concepts and theories have been introduced. In this section, we will bring together insights from E. Goffman; B. Link and J.Phelan and P. Corrigan and colleagues. The stigmatizing process includes three important aspects, namely stereotypes, prejudices and discrimination (Rüsch, Angermeyer, & Corrigan, 2005). A first cognitive aspect of stigma concerns stereotypes. Stereotypes are collective knowledge structures that are known by most members of a social group. Stereotypes are mostly negative and simplified opinions about a certain group of people, which allow others to quickly generate impressions and expectations toward the members of the stereotyped group. An example of a stereotype is that people with psychological problems are unreliable. That such stereotypes are known by most people, doesn't automatically mean that one agrees with them. Second, prejudice is the confirmation of a stereotype, which involves an emotional reaction. An example is that people will feel uncomfortable and anxious nearby someone with psychological problems. Third, discrimination is the behavioral aspect of stigma. The emotional reaction will trigger a behavioral response. People will for example keep distance from someone with psychological

problems. Considering the negative impact of stigma on most members of a stigmatized group, it is by definition assumed that the stigmatizing group has more social power than the stigmatized group (Link & Phelan, 2001).

A central concept within the stigmatizing process is 'labeling'. Labeling implies that someone is identified as a member of a stigmatized group, to accomplish some degree of separation of “us” from “them”. Therefore this person will be stereotyped, he will be victim of prejudice and he risks to be discriminated (Link, Struening, Neese-Todd, Asmussen, & Phelan, 2001). According to the original Labeling Theory of Scheff (1966), this means that the stigmatized person is forced to maintain his role of a 'psychological ill' person. A more recent interpretation of the Labeling theory suggests that labeling negativaly affects ones self-esteem, self-reliance and social status (Link, Cullen, Struening, Shrout, & Dohrenwend, 1989; Link et al., 2001). The labeled and thus stigmatized person will have less opportunities to develop or to maintain a professional and social network, and consequently risks of standing on the edge of social isolation. This has a negative effect on one's health and quality of life. It creates an additional source of stress, what makes the labeled person more vulnerable to develop new psychological problems (Corrigan & Rao, 2012; Crisp, Gelder, Rix, Meltzer, & Rowlands, 2000).

For people belonging to a stigmatized group, it is often difficult to prevent stigmatization. Stigmatized people can try to inform their environment, hoping that the stigmatization will disappear. Often however, one does not have the opportunity or strength to react against the stigmatization. In this case, stigmatized people tend to withdraw from professional and social networks in order to escape the stigma. Another possibility is trying to hide the characteristics that are part of the stereotyping. One way for people with psychological problems to prevent being labeled, is not talking about their psychological problems with family and friends or not seeking professional help. Seeking informal or professional help does not only mean that one reveals his problems and thus easily can be labeled. It also implies that one confirms prevailing prejudices and stereotypes that people with psychological problems are not capable of taking care of themselves. Research shows that people with a depressive disorder were more often stigmatized when they received professional help than when they did not receive help (Ben-Portath, 2002; Sibicky & Dovidio, 1986).

We can distinguish three types of stigma. A first form is public or personal stigmatization. Public or personal stigmatization refers to the discrimination of and the stigmatizing attitudes toward the stigmatized group by members of the general population (Corrigan, Rafacz, & Rüsch, 2011). Within the scope of this Thesis, we focus on the two other types of stigmatization, i.e. self-stigmatization and perceived stigmatization. The emphasis lies hereby on stigmatization in relation to help-seeking.

1.2.1. Self-stigmatization

Self-stigmatization refers to the internalization of stigma by the people who belong to a stigmatized group. Just as the general concept of stigma, self-stigmatization consists of stereotypes, prejudices, and discrimination (Rüsch et al., 2005). People with psychological problems who experience self-stigmatization, apply existing stereotypes to themselves. They believe, for example, that they are unreliable in relation to others. Subsequently they develop a prejudice about themselves. This emotional reaction can lead to low self-esteem and helplessness. This eventually manifests itself in

social isolation and help negation. Having knowledge of public stigmatization is necessary but not sufficient to internalize the stigma. Corrigan and Watson (2002) state that, in order for self-stigmatization to occur, one has to experience the stigmatization as legitimate and has to believe that the stigmatization applies to himself and his situation. Self-stigmatization is a personal internalization of stigma, but it does not imply that someone who experiences self-stigma, will judge others in a similar situation. This is apparent in the observation that people who indicate having psychological problems, have less stigmatizing attitudes toward other people with similar psychological problems compared to the general public (Aromaa, Tolvanen, Tuulari, & Wahlbeck, 2011; K. Griffiths, Christensen, & Jorm, 2008).

When a person experiences the stigmatization as illegitimate, his self-esteem is less or not affected at all. In this situation, we can differentiate between persons who do and do not identify themselves with the stigmatized group. In the first case, the person who identifies with the stigmatized group will more often react with anger and aversion. In the second case, the person will stay indifferent toward the stigmatization and there will be no effect of the stigmatization on the self-esteem (Corrigan & Watson, 2002).

Different studies showed a negative relationship between self-stigmatization and positive attitudes toward help-seeking (Bathje & Pryor, 2011; D. L. Vogel, Wester, Larson, & Hackler, 2007) and intentions to seek help (Barney et al., 2006; Brown et al., 2010; Vogel, Wade, & Haake, 2006). In addition, self-stigmatization also influences provider choice. For example, it was found that general practitioners generate less self-stigmatization and shame than psychotherapists and psychiatrists (Barney et al., 2006; Brown et al., 2010; Vogel et al., 2006).

Within the scope of this discussion we introduce another possible reaction, namely the feeling of shame. In the literature, shame is often supposed to be inherent to self-stigmatization (Barney, Griffiths, Christensen, & Jorm, 2010). Shame is an emotional reaction as a result of the fear of being socially excluded and devaluated (Rüsch et al., 2009). It is indeed plausible that self-stigmatization leads to shame. Shame however, can also exist without self-stigmatization. This is the case when one expects to be stigmatized, without the necessity to internalize or legitimize the stigmatization. There is however not much research about the relationship between shame and intentions or attitudes in relation to help-seeking. Barney et al. (2006) found that shame was related to reduced intentions to seek help in the general Australian public. Another analyses on the same dataset showed that shame is weakly correlated with intentions to seek help (Barney et al., 2010). A study among elderly showed that shame was a barrier to seek psychological help (Kageyama, 2012).

1.2.2. Perceived stigma

Perceived stigmatization, in the literature also called anticipated stigmatization, refers to stigmatizing attitudes that people perceive in society. Research shows that the number of people perceiving stigma is greater than the number of people who stigmatize or the number of people who experience stigma (Eisenberg, Downs, Golberstein, & Zivin, 2009). Public stigma is often underestimated because people are often not inclined to reveal their stigmatizing attitudes. Reporting perceived stigma though, is less subject of social desirability (Griffiths et al., 2006). Besides this, it is observed that perceived stigma occurs more often than experienced stigma. A worldwide study shows that less than half of the persons with a depression who expect stigmatization, actually experience stigmatization (Lasalvia et al., 2012).

The relationship between perceived stigmatization and the intention to seek help and attitudes toward help-seeking is less clear than the relationship between self-stigmatization, attitudes and intentions. Different studies about barriers to seek help conclude that perceived stigmatization is associated with a reduced intention to seek help (Gulliver, Griffiths, & Christensen, 2010) and reduced treatment adherence (Gabriel & Violato, 2010; Henderson, Evans-Lacko, & Thornicroft, 2013; Mitchell & Selmes, 2007). The latter implies that stigmatization can also influence the effectivity of care. Other studies found that perceived stigmatization is associated with the intention to seek help but not with received help (Golberstein, Eisenberg, & Gollust, 2008; Schomerus & Angermeyer, 2008). Adversely, recent research found no association between perceived stigma and intentions to seek help (Bathje & Pryor, 2011; Brown et al., 2010; Vogel, Wester et al., 2007). A possible explanation for the absence of a relationship between perceived stigma and intentions, is that people believe that they can hide seeking help. If this is the case, one will not be labeled and not have to fear stigmatization (G. Schomerus, Matschinger, & Angermeyer, 2009). Another explanation is that the relationship between perceived stigma and intention is mediated by self-stigma and attitudes (Bathje & Pryor, 2011; Vogel, Wade et al., 2007). A longitudinal investigation showed that perceived stigma is positively related to self-stigmatization, but not vice versa (Vogel, Bitman, Hammer, & Wade, 2013). The authors conclude that self-stigmatisation is a more proximal determinant of attitudes and intentions than perceived stigma (Brown et al., 2010; Vogel et al., 2013).

1.3. The role of culture

Stigma and attitudes are not merely individual characteristics. The Labeling theory is explicitly based on the idea that individuals internalize social frames concerning psychological problems and help-seeking through socialization (Link et al., 1989). This implies that most people have knowledge of the prevailing public stigma, even when they are not part of the stigmatizing or stigmatized group. This mechanism explains why perceived and self-stigma prevail and even influence behavior, without actual prejudice or discrimination coming about. However, research shows that there is a strong association between the public stigma in a community and the individual stigma of the members within the same community (Mojtabai, 2010). A research in 14 European countries, using two independent data sets, found that people with psychological problems living in countries with less stigmatizing attitudes toward psychological problems, experience less self-stigmatization and less often postpone seeking help, than people living in countries with more stigmatizing attitudes (Evans-Lacko, Brohan, Mojtabai, & Thornicroft, 2012).

The cultural nature of stigmatization has two important implications. First, through socialization stigma, perceived stigma and self-stigmatization can occur among people who never where the victim of stigmatization. Secondly, since stigmatisation is created on the level of communities, stigmatizing attitudes and corresponding consequences can differ strongly between communities (Angermeyer & Matschinger, 1999; Cooper, Corrigan, & Watson, 2003; Kathleen M. Griffiths et al., 2006)

1.4. Attitudes and stigma in relation to suicide rates

From the above theoretical background, we can differentiate two processes in which stigma can have an effect on suicide. The first is an indirect effect through help-seeking. Persons who expect stigma because of psychological problems or psychological help-seeking, will often avoid being labeled by not disclosing psychological problems or not seeking help. (Corrigan, 2004). Second, as explained above, self-stigmatization has a negative effect on the self-esteem and self-efficacy. Actual seeking help for psychological problems can hereby reinforce the feeling of helplessness. Therefore, seeking help can be experienced as a cost rather than a benefit (Corrigan et al., 2011). Moreover, research shows that self-stigmatization is associated with more negative attitudes toward help-seeking and weaker intentions to seek help (L. Barney, 2010; D.L. Vogel et al., 2007). These negative attitudes and weak intentions are important barriers of help-seeking. Given the assumption that help-seeking for psychological problems is a protective factor of suicide, we can conclude that stigma through help-seeking intentions and behavior, are indirectly related to an increased risk of suicide.

Beside this indirect association with suicide, there are also indications that stigmatization has a direct impact on suicide risk (Kageyama, 2012; Pompili, Mancinelli, &Tatarelli, 2003). Suicidal behavior can be explained by the Stress-Diathesis model, where the suicidal person displays biological, psychological and social vulnerabilities (K. Van Heeringen, 2012). In combination with certain stressors, vulnerable persons can end up in a hopeless and helplessness situation, where suicide seems to be the only way out of the unbearable emotional pain. The Stress-Diathesis model is also applicable to stigma and suicide. Stigmatization is by definition related to persons who are vulnerable, either because of certain characteristics such as psychological problems or because of the consequences of stigmatization such as discrimination. People with psychological problems often have more difficulties to perform daily tasks, to maintain social and professional relations and to cope with stressful situations. Beside psychological vulnerability, people with psychological problems also have to cope with the negative consequences of stigmatization, such as lowered self-esteem and reduced self-efficacy, hopelessness and social isolation (Rüsch, 2009). Based on the Stress-Diathesis model, we can assume that psychological problems are part of the diathesis and that stigmatization is the stressor.

We conclude that there is a theoretical basis to assume that stigmatization can have a direct and indirect effect on suicide. Since stigmatizing attitudes are shaped within a cultural context and regions can differ culturally, it means that stigmatization possibly also can explain differences between regional suicide rates. Until now research investigating the association between stigma and attitudes toward help-seeking for psychological problems on the one hand and suicide on the other hand, is scarce.

2. Flanders and the Netherlands: A case study

As two neighbouring regions, Flanders and the Netherlands resemble on many dimensions. For example in 2012, the fertility rate is 1.75 and 1.72, the percentage of students in all levels of education is 25.3 and 25.2, the populations density is 478.2 and 496.9/km², the

employment rate is 4.5% and 5.3% and the percentage of people at risk of poverty is 15.0 and 15.7 for Flanders and the Netherlands respectively (Eurostat). Besides these similarities between the two Dutch speaking regions, there are also noticeable differences. Probably one of the most remarkable differences is the discrepancy in suicide rates. The average suicide rate over the period 2005-2010 was 80 percent higher in Flanders (15.4/100.000 inhabitants) than in the Netherlands (8.8/100.000 inhabitants). There are also differences in culture and mentality which for example influence the way both populations cope with stressors. In the following study, these cultural differences are translated in terms of intentions, attitudes and stigma related to help-seeking and suicide.

2.1. Research design

In this paragraph we describe the research design of Study 4. The following topics will be covered: 1) the sampling procedure and its outcome, 2) the data collection procedure and 3) the research questions.

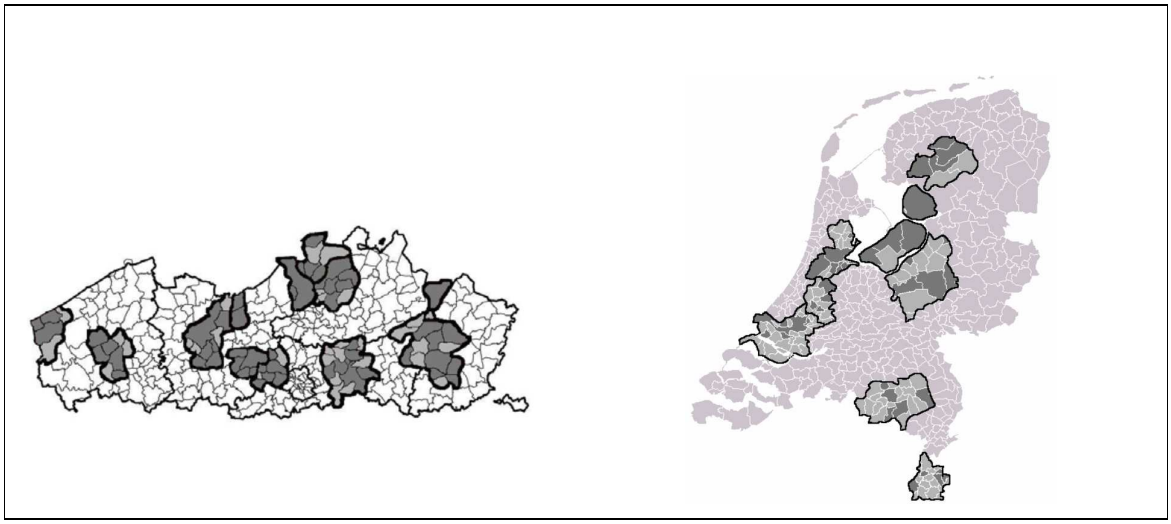
2.1.1. Sample

The research population is the general population between 18 and 65 year old with a Belgian or Dutch nationality. For the selection of the sample units, we made use of a combination of a cluster sample and systematic sample. More specifically, multi-stage cluster sample means that we started at the provincial level and out of each province we selected the regions. In the Netherlands, these were so called 'COROP-regions' and in Flanders 'care regions'. These regions are defined by the authorities with the purpose of conducting long term cross-regional research (the Netherlands) or evaluating and adjusting the health policy (Flanders). Out of these regions we further selected municipalities and out of the municipalities, we finally selected the individual respondents. The individuals were selected out of the population register by the National Register in Flanders and by the selected municipal authorities in the Netherlands. For the selection of the units at each stage we made use of a systematic sampling technique.
The result is a random, geographically well spread and representative sample. The Dutch sample contains 4550 individuals out 38 of the 403 municipalities, out of 8 COROP regions and 7 provinces. In Flanders the outcome of this procedure was 4550 individuals, out of 52 of the 306 municipalities, out of 12 care regions and 5 provinces. The results of the procedure are shown in Table 2 and Figure 2.

Table 2 Selected Care regions and COROP - regions

Flanders 12 care regions	Netherlands 8 COROP-regions
Roeselare	Oost-Zuid-Holland
Veurne	Zuid-Limburg
Aalst	Flevoland
Gent	Zuidoost-Noord-Brabant
Lokeren	Veluwe
Hasselt	Groot-Rijnmond
Lommel	Groot-Amsterdam
Asse	Zuidoost-Friesland
Leuven	
Antwerpen	
Schilde	
Brasschaat	

Figure 2 Cartographic representation of selected regions and municipalities (dark grey) of Flanders (L) and the Netherlands (R).

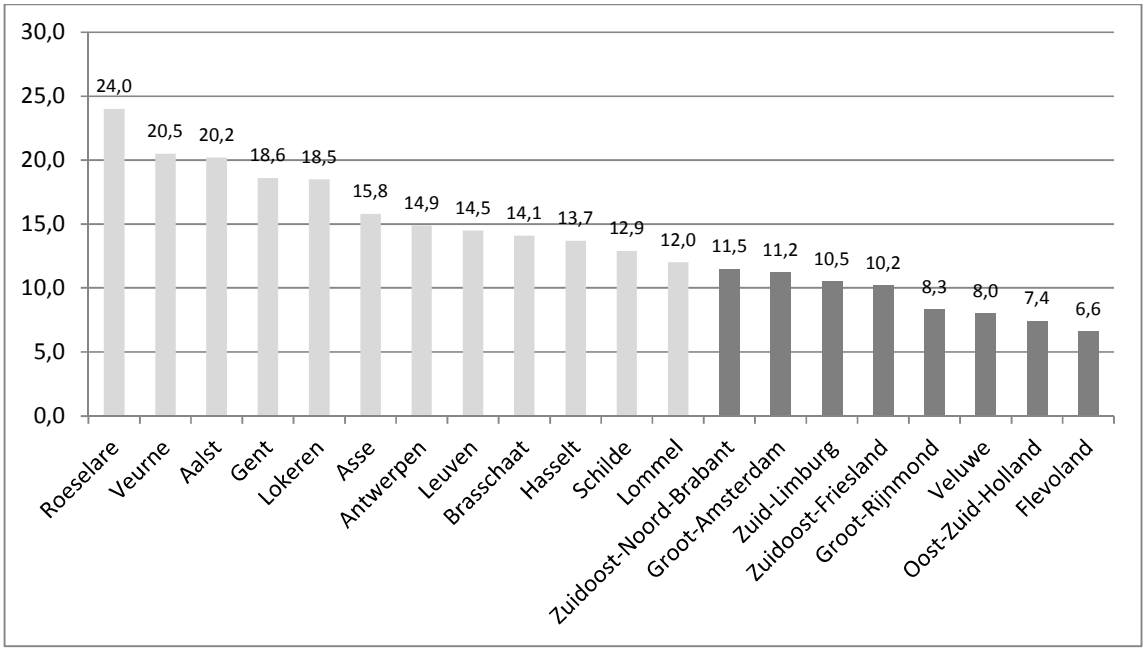


2.1.2. Research procedure

The data collection was identical for Flanders and the Netherlands. Selected persons received a structured postal questionnaire and a guided letter. The letter explained the research goal, the voluntary nature of participation, the sample procedure and the anonymous character of the study. In addition, the letter contained contact information of the research team and the coordinates of a crisis line. Furthermore, the letter explained that participants had a chance of winning an incentive (a movie ticket or a gift card). Beside a questionnaire and guided letter,

the selected persons received an empty stamped envelope to return the completed questionnaire. Non-respondents received a reminder card after 2 weeks and another questionnaire after 4 weeks. This procedure was submitted for evaluation to the Commission for the Protection of Privacy in Flanders and Medical-Ethical Review Commission for Mental Health Care. The data collection took place in November and December of 2009 in Flanders and 2010 in the Netherlands. The data collection was supported by the Department of Clinical psychology of the VU Amsterdam led by Prof. Dr. A. Kerkhof. The suicide rates for the 20 selected regions were gathered via the Agency for Care and Health for Flanders and the Central Bureau of Statistics for the Netherlands (see Graph 2).

Graph 6 Suicide rates per 100,000 inhabitants for the selected regions over the period 2005-2010



2.2. Research questions

The fourth research question of this Thesis is:

Are intentions, attitudes and stigma with respect to help-seeking and attitudes toward suicide associated with regional suicide rates?

This research question 4 can be divided into four subquestions:

Subquestion 1 - Paper 3: What are the differences between people with a suicidal past and people without a suicidal past with regard to psychological problems, self-stigma, perceived stigma, attitudes toward help-seeking, intentions to seek informal en professional help and attitudes toward suicide?

Subquestion 2 Paper 3-5: What are the differences between Flanders and the Netherlands concerning psychological problems, suicidal ideation and behavior, self-stigmatization, shame, perceived stigma, attitudes toward help-seeking, intentions to seek informal and professional help, knowledge about health care, satisfaction of care and attitudes toward suicide?

Subquestion 3 - Paper 5: What are the associations between on the one hand self-stigmatization, shame, perceived stigma, attitudes toward help-seeking and on the other hand intentions to seek informal and professional help for psychological problems?

Subquestion 4 - Paper 6: What are the associations between on the one hand self-stigmatization, shame, perceived stigma, attitudes, intentions concerning help-seeking and on the other hand regional suicide rates in Flanders and the Netherlands?

3. Paper 3

Help - seeking, stigma and attitudes of people with and without a suicidal past. A comparison between a low and a high suicide rate country.

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Background: A significant proportion of suicidal persons do not seek help for their psychological problems. Psychological help-seeking is assumed to be a protective factor for suicide. However, different studies showed that negative attitudes and stigma related to help-seeking are major barriers to psychological help-seeking. These attitudes and stigma are not merely individual characteristics but they are also developed by and within society. The aim of this study is twofold. First, we investigate if persons with a suicidal past differ from people without a suicidal past with respect to help-seeking intentions, attitudes toward help-seeking, stigma and attitudes toward suicide. The second aim is to investigate if these attitudinal factors differ between people living in two regions with similar socio-economic characteristics but deviating suicide rates.
Method: We defined high (Flemish Community of Belgium) and low (the Netherlands) suicide regions and drew a representative sample of the general Flemish and Dutch population between 18 and 65 years. Data were gathered by means of a postal questionnaire. Descriptive statistics are presented to compare people with and without suicidal past. Multiple logistic regression was used to compare Flemish and Dutch participants with a suicidal past.
Results: Compared to people without a suicidal past, people with a suicidal past are less likely to seek professional and informal help, perceive more stigma, experience more self-stigma (only men) and shame (only women) when seeking help and have more accepting attitudes toward suicide. In comparison to their Dutch counterparts, Flemish people with a suicidal past have less often positive attitudes toward help-seeking, less intentions to seek professional and informal (only women) help and have less often received help for psychological problems (only men).
Limitations: The main limitations are the relatively low response rate; suicidal ideation was measured by retrospective self-report; and the research sample includes only participants between 18 and 65 years old.
Conclusions: Having a suicidal past is associated with attitudinal and stigmatizing barriers toward help seeking and accepting attitudes toward suicide. Prevention strategies should therefore address this target people with a suicidal history with special attention for attitudes, self-stigma and feelings of shame related to help-seeking.

INTRODUCTION

Research shows that nine out of ten suicide victims suffered from at least one severe psychological problem (Nock et al 2008). As a consequence, receiving psychological help is a assumed to be a protective factor of suicide. Not receiving adequate help increases the risk for psychological problems to deteriorate and thus increasing the risk of suicide (Suominen et al 2004). A number of researches showed that persons with suicidal thoughts were less likely to seek psychological help compared to those who have psychological problems but no suicidal thoughts (Calear et al 2014; Carlton & Deane 2000; Gould et al 2004; Rancans et al 2003; Rickwood et al 2005). Not seeking psychological help is associated with negative attitudes and stigma in relation to help-seeking (Vogel, 2007). Furthermore, research found that the majority of people experience stigma and shame if they would receive psychological help (Reynders et al 2014).

According to psychological health models, having a negative attitude toward a behavior (e.g. help-seeking) will decrease the intention to actually conduct this behavior (Ajzen & Fishbein 2000). Stigma is a negative stereotype about people because of their characteristics or behavior. When believed by a substantial part of the general public these stereotypes can lead to prejudice and discrimination (Corrigan & Rao 2012). In this study we distinguish between two kinds of stigma. First, perceived stigma refers to the stigmatizing attitudes toward people who receive psychological help one observes in his environment (Link et al 1989). Perceived stigma implies that people are convinced that they will be discriminated against if they would seek help for psychological problems. Second, self-stigma for psychological help-seeking is the internalization of the stigmatizing attitudes (Rüsch et al 2005). People who experience self-stigma will apply the stigmatizing attitudes on themselves, resulting in low self-esteem and low self-efficacy. A way to prevent being stigmatized is not to disclose psychological problems and not to seek help (Vogel et al 2007). Furthermore, research found that people without a suicidal past have more disapproving attitudes toward suicide than people with a suicidal past (Arnautovska & Grad 2010; Colucci & Martin 2007; Gibb et al 2006; Joe et al 2007; Kocmur & Dernovsek 2003; O'connor et al 2006). The disapproving attitudes of others could create feelings of shame in seeking psychological help among people with suicidal problems (Kageyama, 2012).

Important to notice within the scope of cross-national analysis is that stigma and attitudes are not just individual features. They are social conceptions rooted in a cultural context (Rüsch et al 2005). They can vary across regions and therefore possibly explain regional differences in help-seeking behavior and suicide rates. For this reason, it would be of interest to compare two regions which resemble with respect to socio-economic indicators, language, geographic and demographic characteristics but have strongly deviating suicide rates. Two regions who satisfy these conditions are Flanders and the Netherlands. For example in 2012, the fertility rate is 1.75 and 1.72, the percentage of students in all levels of education is 25.3 and 25.2, the populations density is 478.2 and 496.9/km², the employment rate is 4.5% and 5.3% and the percentage of people at risk of poverty 15.0 and 15.7 for Flanders and the Netherlands respectively (Eurostat 2014). However, there are also significant differences in suicide rates between the two Dutch speaking regions (Reynders et al 2014). The Flemish suicide rates are almost 80 percent higher (15.4/100.000 inhabitants) than in the Netherlands (8.8/100.000 inhabitants). Despite these

differences in suicide rates, cross-national research did not find significant differences between the two regions with respect to the incidence of life time suicidal ideation (8.2% in the Netherlands and 8.4% in Belgium) and suicide attempts (2.3% and 2.5%) (Bernal et al., 2007). Although suicidal ideation and behavior are assumed to be important antecedents of suicide on an individual level, on the cross-national level the association between both is unclear (Bernal et al 2007; Bertolote et al 2005; Casey et al 2008). It is argued that from an epidemiological point of view, the suicidal process is not a clear-cut transition from ideation to attempt to suicide. Possibly, Dutch people cope differently and more effectively with psychological and suicidal problems than Flemish people resulting in higher suicide rates among the latter.The aim of this study is to investigate if people with a suicidal past differ from people without a suicidal past with respect to intentions, attitudes and stigma associated with help-seeking and attitudes toward suicide. We hypothesize that, compared to people without a suicidal past, people with a suicidal past have weaker intentions to seek psychological help, perceive more stigma, experience more self-stigma and shame related to help - seeking and have more approving attitudes toward suicide. In addition, we expect that these differences are more apparent in Flanders than in the Netherlands.

METHOD

Study sample

The target population for this study is the general population of Flanders and the Netherlands with a Belgian and Dutch nationality respectively. Because of methodological and ethical reasons, only data within the age group 18 through 65 years were gathered. Even though data are available on French speaking Belgium as well, we have chosen to compare two Dutch speaking geographical entities. Evidently, also comparisons between Belgium as a whole and the Netherlands on the one hand, and between Flanders and the French Community on the other is of interest; this is outside of the scope of this paper. For the selection of the sample units, we made use of a combination of a cluster sample and systematic sample. Multi – stage cluster sample means that we started at the provincial level, out of each province we selected the regions. In the Netherlands, these were so called ‘COROP-regions’ and in Flanders ‘care regions’. These regions are defined by the authorities with the purpose of conducting long term cross-regional research (the Netherlands) or evaluate and adjust health policy (Flanders). Out of these regions we further selected municipalities and out of the municipalities, we finally selected the individual respondents. For the selection of the units at each stage we made use of a systematic sampling technique. The result is a random, geographically well spread and representative sample. The Dutch sample contains 4550 individuals out 38 of the 403 municipalities, out 8 COROP regions and 7 provinces. In Flanders the outcome of this procedure was 4550 individuals, out of 52 of the 306 municipalities, out of 12 care regions and 5 provinces. The systematic sample of individuals was selected out of the official population register by the authorities.

Procedure

The procedure for both countries was identical. The selected individuals received a structured postal questionnaire together with a guided letter. The letter informed the participants about the

goal of the research, the voluntariness of participation and the anonymity of the study. Beside this, a telephone number and website of a free and anonymous crisis line was mentioned for those who may need it. Finally, participants were informed that they had the chance to win an incentive in the form of two film tickets or a gift voucher. Non-respondents received reminders after two weeks and after five weeks. This research procedure was evaluated by the Belgian Privacy Commission and the Dutch Ethical Commission. The data collection took place during the months of October and November 2009 (Flanders) and 2010 (The Netherlands). The response rate was 27.4% (The Netherlands) and 41.4% (Flanders). In study we analyzed data of 2978 Dutch and Flemish participants.

Instruments

The Self-Stigma of Seeking Help –Scale, Attitudes toward Seeking Professional Psychological Help- scale (Short form) and Perceived Devaluation- Discrimination –scale, discussed below, were independently translated into Dutch by two researchers focusing on the meaning of the items rather than literally translating the wording. Both translations were brought together and discussed by the two translating researchers and a third researcher. Cronbach's Alpha for the translated scales are presented.

Demographic variables. The survey included questions about age, years of schooling, civil state and employment.

Suicidality. Participants were asked for their personal life time experience with suicidality. Three questions were asked, each measuring a phase of the suicidal process: death wish, suicide plan and suicide attempt. In our analysis, people who indicated that during their lifetime they ever had a death wish, suicide plan or attempted suicide, are defined as having a 'history of suicidality'.

Mental health. This was measured by the five item mental health summary scale of the SF-36. The SF-36 was constructed to satisfy minimum psychometric standards necessary for group comparison. The SF-36 is suitable for self-administrated surveys within the general population. Reliability and validity are well established. Scores ranged from 0 to100. A score ≤ 52 indicates emotional problems with possibly a psychiatric disorder (Ware et al 1994).

Intention to seek help. The respondents were asked yes or no if they would seek help if they were confronted with psychological problems in the future. Three types of help are distinguished. First, professional help includes help from a general practitioner, a psychotherapist or a psychiatrist. Second, informal help refers to help from friends and family. The third type is not seeking help or passive coping, meaning that respondents would do nothing and hope that the psychological problems would disappear out of their own.

History of professional help seeking. Respondents were asked yes or no if they had ever received help for psychological problems from a general practitioner, a psychotherapist or a psychiatrist.

The concept ‘psychological problems’ was explained by two vignettes describing a man and woman with depressive symptoms such as feeling fatigue, helpless, worthless, down, feeble, and sad during several weeks. They had little energy for fulfilling daily tasks or doing sports, they had diminished interests, sleeping problems and they had suicidal thoughts.

Self-stigma was measured by the Self-Stigma of Seeking Help –Scale (SSOSH). The scale has a uni-dimensional factor structure and consists of 10 items such as “Seeking psychological help would make me feel less intelligent” (Vogel et al 2006). The internal consistency of the original

scale ranged between .86 to .90 (Vogel et al 2007). In our sample Cronbach's Alfa was .85. Correlation with the intention to seek counseling and attitudes toward help seeking proves its construct validity (Vogel et al 2006). Higher scores represent higher self-stigma. Scores went from 0 to 100. Percentage of people with a score of > 50 were calculated. Translation of the instrument was conducted by

Shame for help - seeking: We developed three six – point Likert items. The items were: 'I would prefer that my neighbors did not know if I would receive help for psychological problems', 'I would be ashamed if I needed help for psychological problems' and 'I would keep it to myself if I would receive help for psychological problems'. The internal consistency of the three items was .80.Previous analysis showed good construct validity with Attitudes toward Seeking Professional Psychological Help- scale (Short form) and discriminant validity with Self-Stigma of Seeking Help –Scale (Reynders et al 2014). Scores went from 0 to 100. Percentage of people with a score of > 50 were calculated.

Perceived stigma was measured by the Perceived Devaluation- Discrimination –scale (Link et al 1987). The scale was developed as a one-dimensional scale containing 12 items such as "Most people feel that entering a mental hospital is a sign of personal failure". The average internal consistency is .78 and the scale shows good construct validity through a relationship with internal experience of demoralization and lower self-esteem (Link & Phelan 2001). The internal consistency obtained in our sample was .85. Higher scores on a scale from 0- 100 reflect higher perceived stigma. Percentage of people with a score of > 50 were calculated.

Attitudes toward help seeking was measured by Attitudes toward Seeking Professional Psychological Help- scale (Short form) and it was developed to measure mental health treatment attitudes. This widely used scale was designed as a one-dimensional 10 item scale (Fischer & Farina 1995). Test –retest reliability (.80), and internal consistency (.84) were good. In our sample internal consistency was .81. In our sample internal consistency was .81.Validity was proved to be good through a negative relation with stigma and positive relations with emotional disclosure and intention to seek help (Elhai et al 2008). Higher scores represent more positive attitudes toward help-seeking. Percentages that had a score of > 50 were calculated.

Attitudes toward suicide. Six items with a six point - Lickert scale were developed for this study. Approving attitudes were measured by the next three items: 1) there are situations in which suicide is the only way out; 2) if I suffer from a sever and incurable disease and 3) I would consider suicide; everybody has the right to commit suicide. The Cronbach's Alpha for these three items were .655 for the Dutch population and .638 for the Flemish population. Although rather low, an Cronbach's Alpha value of $\geq .60$ for new scales and scales with few items is acceptable (Nunnally 1988). Three items measured disapproving attitudes toward suicide: 1) suicide means that one is walking away from his daily responsibilities;. 2) people who consider suicide, would feel better if they would not let themselves go and show some strength instead and 3) suicide is a cowardly act. The internal consistency for the Dutch population was .724 and .738 for the Flemish population. The scores were recalculated on a scale from 0 to 100 with a cut-off score of 50.

Analysis

First, we present the incidences of lifetime death wishes, suicide plans and suicide attempts for Dutch and Flemish men and women (Table 1). Next we presented percentages and 95% confidence intervals to compare men and women with a suicidal past (Table 2). Logistic regression was used to analyze the differences between people with and without a suicidal past (table 3) and differences between Dutch and Flemish participants with a suicidal past (Table4). Adjusted odds ratios are presented together with 95% confidence intervals and p-value. The first model includes the all the demographic variables. Next we included all other variables separately using the 'enter' method in Model 1, thus adjusting for the demographic variables age, education level, marital status and employment status. This was done because the help-seeking intentions and attitudinal variables correlates significantly. As a result, they would neutralize each other's effect when including them all together in the regression equation. Because of differences between men and women with respect to the prevalence of suicidal ideation, intentions to seek help and attitudinal factors (Reynders, 2014), all analyses are split by gender. For the analysis we used the statistical package SPSS.

RESULTS

Table 1 indicates that lifetime suicidality in our sample does not differ between Flanders and the Netherlands, with the exception of lifetime death wish among women (OR = 1.26, p = 0.044).

Table 1 Lifetime suicidal ideation, plans and attempts in the Netherlands and Flanders for men and women

		Men (N = 1204)				Women (N = 1774)			
		%	Adj.OR*	95% CI	P	%	Adj.OR*	95% CI	P
Death wish	Netherlands	28.7	1.00			33.6	1.00		
	Flanders	31.6	1.26	(0.99-1.61)	0.056	38.0	1.26	(1.01-1.59)	**0.044**
Suicide plans	Netherlands	12.5	1.00			12.9	1.00		
	Flanders	13.4	1.25	(0.89-1.74)	0.202	14.0	1.20	(0.87-1.67)	0.268
Suicide attempt	Netherlands	4.9	1.00			4.8	1.00		
	Flanders	4.5	1.11	(0.65-1.92)	0.696	5.9	1.61	(0.96-2.70)	0.070

***OR adjusted for age, education, civil state and employment status**

Table 2 shows that among people with a suicidal history, compared to men, women received more often professional psychological help and have more often the intention to seek informal and professional help. Men reported more often that they would cope passively with psychological problems and that they would more often experience self-stigmatization when seeking help. Furthermore, compared to women, the proportion of men having disapproving as well as accepting attitudes toward suicide is higher.

Table 2 Comparison between men and women with a life time history of suicidal thoughts.

	Men N = 368		Women N = 641	
	%	95% C.I.	%	95% C.I.
Age				
18-34	30.3	(25.6-35.0)	32.0	(28.4-35.6)
35-49	32.0	(27.2-36.7)	35.9	(32.2-39.6)
50-64	37.7	(32.7-42.7)	32.1	(28.5-35.8)
Married	40.3	(35.3-45.3)	48.8	(44.9-52.6)
Education				
lower secondary	17.7	(13.8-21.6)	19.2	(16.1-22.2)
upper secondary	41.4	(36.4-46.5)	39.9	(36.1-43.7)
Superior or +	40.9	(35.8-45.9)	40.9	(37.1-44.7)
Unemployed	8.2	(**5.3-11.0**)	3.4	(**2.0-4.9**)
Good mental health	73.5	(69.0-78.1)	71.1	(67.6-74.7)
Previous professional help	55.8	(**50.7-60.9**)	69.7	(**66.1-73.2**)
Intention to seek help				
Professional	56.8	(**51.8-61.9**)	68.2	(**64.6-71.9**)
Informal	57.8	(**52.7-62.9**)	67.2	(**63.5-70.8**)
Passive coping	34.7	(**29.8-39.6**)	21.3	(**18.2-24.5**)
Stigma & attitudes				
Self-stigma	30.8	(**26.0-35.6**)	21.4	(**18.2-24.7**)
Shame	68.1	(63.3-73.0)	62.3	(58.5-66.1)
Perceived stigma	75.2	(70.7-79.7)	76.1	(72.8-79.5)
Positive attitudes help seeking	69.7	(64.9-74.5)	80.8	(77.7-83.9)
Attitudes toward suicide				
Disapproving	27.9	(**23.3-32.5**)	17.6	(**14.6-20.6**)
Accepting	67.0	(**62.2-71.9**)	51.4	(**47.4-55.3**)

Significant differences between people with and without suicidal past are in bold

Table 3 shows that compared to people without a suicidal past, those with a suicidal past are less often married and men are more often unemployed. We notice also that people with a suicidal past had less often a good mental health during the last four weeks and they had more often received psychological help but they were also less likely to seek help in the future compared to people without suicidal past. Furthermore, although no differences were found with respect to attitudes toward help - seeking between people without and with suicidal past, the latter perceived more stigma and experienced more self - stigma (men only) and shame (women only). Finally, having a suicidal past was associated with more accepting and less disapproving attitudes toward suicide.

The comparison between Dutch and Flemish men with a history of suicidality is presented in Table 4. After controlling for demographic factors, we noticed that compared to Dutch men, Flemish men are less inclined to seek professional help for psychological problems (OR = 0.44, p = 0.000), have less often received professional help in the past (OR = 0.64, p = 0.037), and have less positive attitudes toward professional help seeking (OR = 0.68, p = 0.016). More Dutch than Flemish women have the intention to seek professional (OR =0.56, p = 0.009), and

informal help (OR = 0.58, p = 0.015) for psychological problems. Moreover, Dutch women have more often positive attitudes toward professional help seeking than their Flemish counterparts (OR = 0.43, p = 0.002) and experience more shame related to help-seeking (OR1.64, p = .007). When reanalyzing the data with people that only had a suicide plan or only have attempted suicide, the direction and effect size of the association remained the same. However, due to a lower number of units and thus a decrease in the statistical power, less associations showed statistical significance.

Table 3 Comparison between people with and without a life time history of suicidal ideation for men and women.

	Men			Women		
	OR[a]	CI 95%	p	OR[b]	CI 95%	p
Model 1						
Age						
18-34	1	***	***	1	***	***
35-49	0.86	(0.58-1.27)	.441	0.95	(0.70-1.29)	.297
50-64	1.07	(0.74-1.56)	**.**718	1.17	(0.88-1.55)	.742
Married	0.44	(0.32-0.61)	**<.001**	0.60	(0.47-0.76)	**<.001**
Education						
lower secondary	1	***	***	1	***	***
upper secondary	0.91	(0.64-1.52)	.966	.78	(0.56-1.01)	.152
Superior or +	0.99	(0.64-1.52)	.955	.87	(0.62-1.21)	.403
Unemployed	2.94	(1.50-5.76)	**.002**	0.98	(0.52-1.88)	.961
Model 2[a]						
Mental health	0,13	(0,08-0,21)	**<,001**	0,15	(0,11-0,21)	**<.001**
Intention to seek help						
Professional	0.68	(0.52-0.90)	**.006**	0.71	(0.57-0.88)	**.002**
Informal	0.30	(0.22-0.41)	**<.001**	0.42	(0.33-0.55)	**<.001**
Passive coping	2.44	(1.81-3.28)	**<.001**	1.40	(1.08-1.82)	**.011**
history of professional help	5.64	(4.19-7.59)	**<.001**	4.98	(3.97-6.24)	**<.001**
Stigma & attitudes						
Self-stigma	1.81	(1.34-2.44)	**<.001**	1.21	(0.93-1.57)	.158
Shame	1.24	(0.94-1.64)	.128	1.93	(1.12-1.71)	**.002**
Perceived stigma	1.57	(1.16-2.12)	**.003**	1.36	(1.07-1.72)	**.011**
Positive attitudes help seeking	1.21	(0.91-1.61)	.200	1.15	(0.89-1.50)	.278
Attitudes toward suicide						
Disapproving	0.43	(0.33-0.58)	**<.001**	0.43	(0.34-0.54)	**<.001**
Accepting	2.78	(2.10-3.68)	**<.001**	2.11	(1.71-2.60)	**<.001**

[a] Model 2: all variables were separately included in Model 1

Nagelkerkes R^2 for the logistic regression including all variables presented in Table 3 was .40 (men) and .31 (women) and for the logistic regression presented in Table 4 it was .12 (men) and .08 (women). Although these are small values, caution needs to be used because this quantity does not have the same interpretational ease as the corresponding R^2 in linear models. The main reason is that the mean and variance structures are functionally and statistically separable for normally distributed outcomes, while they are not for non-Gaussian outcomes.

Table 4 Comparison between Dutch and Flemish men and women with lifetime history of suicidal ideation.

	Men			Women		
	OR[a]	CI 95%	p	OR[b]	CI 95%	p
Model 1						
Age						
18-34	1	***	***	1	***	***
35-49	1.61	(0.99-2.61)	.053	1.09	(0.70-1.69)	.706
50-64	1.89	(1.09-3.27)	**.023**	1.01	(0.62-1.67)	.960
Married	1.39	(0.89-2.16)	.149	0.93	(0.63-1.37)	.695
Education						
lower secondary	1	***	***	1	***	***
upper secondary	1.38	(0.77-2.50)	.278	1.02	(0.61-1.71)	.944
Superior or +	1.03	(0.57-1.85)	.926	0.83	(0.49-1.4)	.479
Unemployed	1.05	(0.51-2.16)	.149	0.73	(0.27-1.99)	.535
Model 2[a]						
Mental health	0.73	(0.45-1.18)	.192	0.93	(0.61-1.41)	.730
Intention to seek help						
Professional	0.44	(0.29-0.67)	**<.001**	0.56	(0.37-0.87)	**.009**
Informal	0.95	(0.62-1.45)	.817	0.58	(0.37-0.90)	**.015**
Passive coping	0.93	(0.61-1.42)	.740	1.35	(0.85-2.16)	.205
history of professional help	0.64	(0.42-0.97)	**.037**	0.69	(0.46-1.04)	.079
Stigma & attitudes						
Self-stigma	1.41	(0.84-2.36)	.199	1.41	(0.91-2.21)	.128
Shame	1.52	(0.94-2.48)	.088	1.64	(1.15-2.33)	**.007**
Perceived stigma	0.84	(0.52-1.36)	.470	1.27	(0.82-1.97)	.284
Positive attitudes help seeking	0.68	(0.36-0.90)	**.016**	0.43	(0.25-0.73)	**.002**
Attitudes toward suicide						
Disapproving	1.48	(0.85-2.57)	.116	1.30	(0.81-2.09)	.273
Accepting	0.82	(0.47-1.41)	.469	0.82	(0.55-1.24)	.267

[a] Model 2: all variables were separately included in Model 1

DISCUSSION

The aim of this study was to investigate how people with a suicidal past differ from people without a suicidal past with respect to their attitudes, intentions and stigma in relation to help-seeking. We examined if suicidal ideation and suicidal behavior occur more often in Flanders than in the Netherlands. Despite the 80% higher suicide rates in Flanders compared to the Netherlands, a significantly higher score for the lifetime prevalence of death wishes was found for Flemish women only. Previous suicide plans and suicide attempts did not differ significantly between the two regions. One could assume that in some countries people, are more inclined to seek help because of the more favorable belief systems concerning suicide, psychological problems and help seeking.

In these countries, as a result, suicidal ideations and behavior are possibly less likely to evolve in suicide. Our data show that in Flanders, where the suicide rates are higher than in the Netherlands, people with a suicidal past were less inclined to seek help for psychological problems and fewer have positive attitudes toward professional help seeking. Among Flemish

men we noticed that they have less frequently received professional help. Flemish women less often have the intention to seek informal help and more often experience shame compared to their Dutch counterparts. In general, a trend becomes apparent in which Dutch participants with a suicidal history are characterized by more protective factors of suicide than the Flemish participants. This could partly explain the differences in suicide rates between the two regions.

Looking at the differences between people with and without suicidal past, we observed that the former are characterized by more risk factors of suicide such as a weaker mental health, not being married and being unemployed (only men). Because people with a suicidal past had more often psychological problems, they received more often psychological help than those without suicidal past. Nevertheless, people with a suicidal past are less willing to seek help for psychological problems in the future. Studies found that one of the greatest barriers for seeking help among suicidal persons is that they less often perceive a need for help (Pagura et al 2009). Other studies pointed out that persons with a history of suicidality less often have effective coping strategies such as avoidance, emotional coping, self-blame, not seeking help and a preference to solve problems on their own (Mathew & Nanoo 2013; McMahon et al 2013; Svensson et al 2014). These findings are in line with our results. We found that people with a suicidal past were more likely to cope passively in case of psychological problems, they would experience more shame (women) and more self-stigma (men) when seeking psychological help. With respect to self-stigma and shame, studies show that they not only result in lower self-esteem and self-efficacy, which are risk factors of suicide. They also inhibit help -seeking intentions (Reynders et al 2014).

Furthermore, we found that people with a suicidal past more often had accepting and less often disapproving attitudes toward suicide. Therefore, we would expect that Flemish people had more tolerable attitudes toward suicide than Dutch people. Although not significant, we observed an opposite tendency. Possibly, the less accepting attitude towards suicide makes it for Flemish people more difficult to disclose suicidal problems making them less likely to seek help.

Even though our research design includes people with at least a death wish during their life and no more strict inclusion criteria such as for example severe suicide plans or attempts during the past 12 months, the differences with people without suicidal past are significant with respect to help seeking intentions, experiencing stigma and attitudes toward suicide. Therefore, we believe that for the prevention of suicide it is important to invest in a positive image of mental health care, making it as accessible as possible for those in need of professional help. Hereby, it is of importance to acknowledge that even people with limited suicidal thoughts during their life time are already more vulnerable for stigmatizing attitudes and feelings of shame with respect to help-seeking. Self-stigma and shame can result in low self-esteem and low self-efficacy, which could further increase the risk of suicide. In addition, having a suicidal past is associated with lower intentions to seek informal help from family and friends. Furthermore, although stigmatizing attitudes toward suicide could result in more negative attitudes towards help-seeking (Calear et al 2014), policy makers and care givers should be reticent in promoting tolerable and accepting attitudes toward suicide to prevent that suicide is seen as a normal way to cope with psychological and suicidal problems. On the other hand, more longitudinal research is needed to understand the direction of the relationship between attitudes toward suicide and suicidal behavior on an individual level as well on a macro-level.

LIMITATIONS

Some limitations should be considered when interpreting the results of this study. First, the response rate is rather low. A review of response rates in academic studies using mail surveys found an average of 55.6% and a standard deviation of 19.7 (Baruch 1999). This can be explained both by the strong emotional connotation of the research subject, as well as by the use of a postal questionnaire for collecting data. Despite of the reminders and incentives, subjects are less compelled and encouraged to participate when contacted by mail than in the case of face-to-face contact. On the other hand, a postal survey creates more security and anonymity, making participants less restrained to answer more sincere. Second, closely related with the first point, the response rate in the Netherlands was lower than in Flanders. The research project was an initiative of a Belgian research team and this was communicated to all potential participants. Possibly, participating and resending their personal and delicate information across the border could be a barrier for the Dutch population. Third, suicidal ideation was measured by retrospective self-report. Therefore, data can be biased. Fourth, analysis was done using data on lifetime suicidal ideation. Comparisons with the general population were not done for suicidal plans and attempts during the last 12 months because of a lack of statistical power. Fifth, the research sample includes only participants between 18 and 65 years old. Therefore, our results cannot be generalized for teenagers and the elderly.

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Conflict of Interest

None

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4. Paper 4

Risico- en beschermende factoren van suïcide in Nederland en Vlaanderen

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Achtergrond Vlaanderen heeft een suïcidecijfer dat 82% hoger is dan dat van Nederland.
Doel Met dit onderzoek gaan we na in welke mate Vlaanderen en Nederland van elkaar verschillen inzake risico- en beschermende factoren van suïcide.
Methode Door middel van een gestructureerde postenquête verzamelden we bij 2999 Vlamingen en Nederlanders tussen de 18 en 64 jaar gegevens over hun psychisch welbevinden, hun suïcidaal verleden, de verkregen hulp en intenties om hulp te zoeken voor psychische problemen, kennis van het zorgaanbod, tevredenheid over de verkregen zorg en hun attitudes ten aanzien van suïcide.
Resultaten Het voorkomen van psychische problemen en het hebben van een suïcidaal verleden verschilt niet significant tussen Nederland en Vlaanderen. Meer Nederlanders hebben ooit hulp gekregen voor psychische problemen en ze hebben vaker de intentie om hulp te zoeken in de toekomst dan Vlamingen. Ook de kennis van en tevredenheid over de zorg is beter in Nederland dan in Vlaanderen. In Nederland heeft men vaker een positieve, aanvaardende attitude ten aanzien van suïcide dan in Vlaanderen.
Conclusie In Nederland scoort men op het vlak van beschermende factoren van suïcide beter dan in Vlaanderen. We overlopen enkele verklaringen voor deze verschillen en bespreken de implicaties voor het suïcidepreventiebeleid.

[English abstract]

Risk and protective factors of suicide in the Netherlands and Flanders

Background: The Belgium region Flanders has a suicide rate that is 82% higher than that of the Netherlands.
Aim: We investigate to what extent Flanders and the Netherlands differ from each other with respect to risk and protective factors of suicide.
Methods: By means of a structured postal questionnaire, we gathered data from 2999 Flemish and Dutch people between 18 and 64 years old about their mental well-being, suicidal past, received help and help-seeking intentions for psychological problems, knowledge of service availability, satisfaction of the received help and attitudes toward suicide.
Results: The incidence of psychological problems and suicidality did not differ significantly between Flanders and the Netherlands. Compared to Flemish people, more Dutch people who

had psychological problems, received psychological help and they more often had the intention to seek help in the future. Furthermore, knowledge of mental health care was better and patient satisfaction was higher in the Netherlands. In the Netherlands, more people had more accepting attitudes toward suicide than in Flanders.
Conclusion: In general, risk factors of suicide were similar in the Netherlands and Flanders. However, Dutch people were characterized by more protective factors. We discuss some explanations for these differences and make suggestions with respect to the prevention of suicide.

Inleiding

Over de periode 2005 tot en met 2010 bedroeg het gemiddeld suïcidecijfer in Vlaanderen 15,4 suïcides per 100.000 inwoners (Agentschap voor Zorg en Gezondheid) tegenover 8,46 per 100.000 inwoners in Nederland (Centraal Bureau voor Statistiek). Hiermee zijn de suïcidecijfers in Vlaanderen 82% hoger dan in Nederland. Bijgevolg is suïcidaliteit een van de belangrijkste gezondheidsverschillen tussen Vlaanderen en Nederland. Deze vaststelling is opmerkelijk omdat, ondanks de verschillen inzake bijvoorbeeld cultuur en de organisatie van de zorg, beide regio's heel wat gelijkenissen vertonen met betrekking tot sociaal - economische, demografische, linguïstische, klimatologische en geografische factoren. Daarom gaan we in dit artikel na of en in welke mate Vlaanderen en Nederland verschillen inzake risico- en beschermende factoren van suïcide en meer in het bijzonder: mentaal welbevinden, intenties om hulp te zoeken, eerder ontvangen hulp, kennis van het zorgaanbod en tevredenheid van de verkregen zorg. Een beter inzicht in deze verschillen kan bepaalde aandachtspunten blootleggen in functie van een geestelijk gezondheids- en suïcidepreventiebeleid. Voor zover we weten zijn vergelijkende gegevens voor Vlaanderen en Nederland beperkt. Hieronder bespreken we hoe deze factoren een risicoverhogende of beschermende rol spelen in relatie tot suïcide.

Aan een suïcide gaat meestal een proces van suïcidale gedachten en suïcidaal gedrag vooraf. Een follow-upstudie toonde aan dat 10 tot 15% van de personen die een suïcidepoging ondernomen hadden, later overleden tengevolge van een suïcide (Suominen e. a. 2004). Dit maakt van eerder suïcidaal gedrag de belangrijkste voorspeller van suïcide.

Een andere belangrijke risicofactor van suïcide zijn psychische problemen. Ongeveer 90 percent van de mensen die overlijden door suïcide, vertoonden tekenen van psychopathologie (Nock e.a. 2008). Onderzoekers leiden hieruit af dat professionele hulp krijgen voor psychische problemen een voorname beschermende factor van suïcide is (Deisenhammer e.a. 2007; Pagura e.a. 2009). Naast beschikbaarheid en toegankelijkheid van de zorg en sociaal - cognitieve factoren zoals attitudes en stigma (Reynders e.a. 2014), zijn eveneens tevredenheid van de eerder verkregen hulpverlening en de kennis van het zorgaanbod belangrijke determinanten van het zoeken van psychologische hulp. Ondanks het feit dat hierover weinig recent onderzoek bestaat, blijkt dat de afwezigheid van kennis van het zorgaanbod vaak gepaard gaat met het uitstellen van het zoeken van hulp (Issakidis & Andrews, 2002). Indien mensen de stap zetten om psychologische hulp te zoeken, heeft de tevredenheid van de ontvangen zorg een positieve impact op de intentie om follow-up consultaties te plannen (Freed e.a. 1998) en zich te houden aan de behandelafspraken (Vermeire e.a. 2002) en bijgevolg dus ook op de effectiviteit van de zorg.

Ook informele hulp zoeken bij familie en vrienden is een beschermende factor ten aanzien van suïcidale gedachten en suïcidaal gedrag, omdat het veronderstelt dat mensen hierdoor gesteund worden wanneer zijn moeten omgaan met stressvolle situaties of psychische problemen (Chioqueta & Stiles 2007, Kleiman & Liu 2013).

Tenslotte hebben verschillende onderzoeken aangetoond dat er een associatie is tussen attitudes ten aanzien van suïcide en suïcidaal gedrag. Mensen die eerder suïcidaal gedrag stelden, hebben vaker tolerante attitudes ten aanzien van suïcide in vergelijking met personen die nooit eerder suïcidaal gedrag stelden (Arnautovska & Grad 2010). Ander onderzoek toonde aan dat depressieve mannen vaker overgaan tot suïcidaal gedrag indien zij een aanvaardende attitude ten aanzien van suïcide hebben (Gibb, 2006).

Met dit onderzoek willen we nagaan in welke mate Nederland en Vlaanderen verschillen inzake deze risico- en beschermende factoren van suïcide.

Methode

Door middel van een systematische en geclusterde steekproef werden 4550 Nederlanders en 4550 Vlamingen tussen de 18 en 64 jaar met respectievelijk de Nederlandse en Belgische nationaliteit geselecteerd. Zij ontvingen via de post een gestructureerde vragenlijst.

Instrumenten

Socio-demografische kenmerken: De respondenten werd gevraagd naar hun leeftijd, geslacht, opleidingsniveau, burgerlijke staat en hun activiteit.

Mentale gezondheid. Door middel van de subschaal MHI-5 uit de SF-36 peilden we naar de mentale gezondheid van de afgelopen vier weken (Ware e.a.1994). De respondenten konden hun antwoord aanduiden op een 6-puntenschaal gaande van nooit tot altijd. Totaalscores werden berekend op 100. Scores onder 52 werden geïnterpreteerd als een zwakke mentale gezondheid (Ware e.a.1994).

Psychische problemen. Om te begrijpen wat we in de context van dit onderzoek verstaan onder psychische problemen, werd de respondenten gevraagd twee vignetten te lezen. De vignetten beschrijven een man en een vrouw die zich depressief, moe, droevig en futloos voelen gedurende meerdere weken. Beiden hebben moeite om dagelijkse huishoudelijk taken uit te voeren en vinden het leven moeilijk om dragen. De respondenten werd gevraagd of ze zelf ooit een vergelijkbare periode hebben meegemaakt zoals beschreven in de vignetten.

Professionele hulp gekregen. Dit werd gemeten aan de hand van de vraag of men eerder professionele hulp gekregen heeft voor psychische problemen van een huisarts, psychotherapeut/psycholoog, psychiater of hiervoor ooit medicatie heeft genomen. De antwoordmogelijkheden waren: ‘nooit’, ‘enkele malen maar niet op regelmatige basis’ en ‘in behandeling geweest’.

Intentie om professionele hulp te zoeken werd gemeten door middel van de vraag of de respondenten indien zij in de nabije toekomst psychische problemen zouden ondervinden, hiervoor hulp zouden zoeken bij een huisarts, psycholoog/psychotherapeut, psychiater, een crisislijn of medicatie zouden nemen.

Intentie om informele hulp te zoeken. De vragenlijst bevatte een item 'zou u hulp zoeken bij vrienden en familie indien u in de nabije toekomst psychische problemen zou hebben'.
Suïcidale gedachten en gedrag. De respondenten werd gevraagd of ze de afgelopen 12 maanden gewenst hadden dat ze dood waren, een concreet suïcideplan hadden gemaakt of een suïcidepoging hadden ondernomen.
Steun zoeken en krijgen voor suïcidale gedachten. De respondenten die aangaven dat ze ooit suïcidale gedachten hebben gehad, werd gevraagd of ze dit ooit met iemand besproken hebben en of ze zich hierbij ondersteund voelden.
Kennis van het zorgaanbod. Er werd gevraagd of men de volgende beroepen of instanties kent: de psycholoog / psychotherapeut, de psychiater, Algemeen Maatschappelijk Werk (Nederland) / Centrum Algemeen Welzijnswerk (Vlaanderen), Geestelijke Gezondheidsinstelling (Nederland) / Centrum Geestelijke Gezondheid (Vlaanderen), 113Online (Nederland) / De Zelfmoordlijn (Vlaanderen).
Patiënttevredenheid. Respondenten die ooit hulp gekregen hadden voor psychische problemen, werd gevraagd om op een schaal van 0 tot 10 aan te duiden hoe tevreden ze waren over deze hulp.
Attitude ten aanzien van suïcide. Voor deze studie ontwikkelden we zes items waarbij de respondent kon antwoorden op een zespuntenschaal, gaande van 'helemaal akkoord' tot 'helemaal niet akkoord'. De subscore op volgende drie items is bepalend voor een aanvaardbare attitude ten aanzien van: 'er zijn situaties waarin zelfdoding de enige uitweg is'; 'ik zou zelfdoding overwegen mocht ik aan een ernstige, ongeneeslijke ziekte lijden'; 'iedereen heeft het recht om zichzelf te doden'. De Cronbach's Alpha voor deze drie items is .655 voor de Nederlandse populatie en .638 voor de Vlaamse populatie. De drie items die een verwerpelijke attitude maten zijn: 'zelfdoding betekent dat je wegloopt van je dagelijkse verantwoordelijkheden'; 'mensen die aan zelfdoding denken, zouden zich heel wat beter voelen moesten ze zich wat minder laten gaan en wat meer karakter tonen'; 'zelfdoding is een laffe daad'. De Cronbach's Alpha voor deze drie items is .72 (Nederland) en .74 (Vlaanderen). De scores op de twee dimensies werden verrekend op 100. Scores boven de 50 werden geïnterpreteerd als 'eerder akkoord' met de dimensie.

Analyse

Voor elk van de variabelen werd het percentage en de 95% betrouwbaarheidsinterval berekend. De analyses geven steeds het verschil tussen mannen en vrouwen en Nederland en Vlaanderen weer. De data werden gewogen op geslacht, burgerlijke staat en leeftijdsverdeling om te compenseren voor non-respons.

Resultaten

De responsgraad voor dit onderzoek was 40,7% voor Vlaanderen en 27,1%. voor Nederland. Tabel 1 geeft de socio-demografische kenmerken van de deelnemers aan het onderzoek weer. We vonden geen significante verschillen tussen Nederland en Vlaanderen en tussen mannen en vrouwen.

Tabel 1 Socio-demografische kenmerken van de respondenten.

	Mannen				Vrouwen			
	Nederland N=471		Vlaanderen N=778		Nederland N=760		Vlaanderen N=1075	
	%	95% C.I.	%	95% C.I.	%	95% C.I.	%	95% C.I.
Leeftijdscategorieën								
18-34	32.7	(29.1-36.5)	33.0	(30.1-36.1)	32.5	(28.8-36.3)	33.1	(30.2-36.3)
35-49	35.8	(32.1-40.0)	35.8	(32.8-39.0)	35.9	(32.0-40.0)	35.6	(32.5-38.7)
50-64	31.5	(28.0-35.3)	31.2	(28.3-34.3)	31.7	(28.0-35.4)	31.3	(28.4-34.4)
Gehuwd	49.3	(45.3-53.2)	52.3	(49.1-55.5)	53.1	(49.1-57.0)	56.3	(53.1-59.6)
Opleidingsniveau								
Laag	16.2	(13.4-19.3)	17.5	(15.3-20.2)	20.5	(17.5-23.9)	17.5	(15.2-20.1)
Midden	39.7	(35.8-43.6)	44.6	(41.4-47.8)	39.9	(36.0-43.8)	40.1	(36.9-43.3)
Hoog	44.0	(40.1-48.0)	37.8	(34.8-41.0)	39.7	(35.8-43.6)	42.4	(39.2-45.7)
Werkloos	3.7	(2.5-5.7)	4.4	(3.3-5.9)	2.9	(1.9-5.0)	3.4	(2.4-4.8)

Uit Tabel 2 kunnen we afleiden dat vrouwen vaker aangaven psychologische problemen gehad te hebben dan mannen. Voor het overige werden er geen significante verschillen gevonden tussen Nederland en Vlaanderen of tussen mannen en vrouwen wat geestelijke gezondheid betreft. Vrouwen hadden over het algemeen vaker professionele hulp gekregen voor psychologische problemen dan mannen. Dit verschil was significant voor hulp zoeken bij een huisarts en bij een psycholoog/psychotherapeut. Meer Nederlandse mannen hadden ooit hulp gezocht voor psychische problemen bij een huisarts of psycholoog/psychotherapeut dan Vlaamse mannen. Bij vrouwen vonden we een gelijkaardig verschil inzake het krijgen van hulp bij een psycholoog/psychotherapeut. Nederlandse mannen hadden significant vaker enige hulp ontvangen dan Vlaamse mannen. Dit verschil was slechts randsignificant voor vrouwen. Daarnaast stelden we vast dat men in Nederland vaker in behandeling is geweest. Dit verschil was significant voor mannen en vrouwen. Meer Nederlandse mannen hadden de intentie om hulp te zoeken bij een psycholoog/psychotherapeut, psychiater en om medicatie te nemen in vergelijking met Vlaamse mannen. Het percentage vrouwen dat hulp zou zoeken bij een psychiater, psycholoog/psychotherapeut was hoger in Nederland dan in Vlaanderen. Vlaamse vrouwen waren eerder geneigd om hulp te zoeken via een crisislijn. Nederlands vrouwen waren vaker geneigd om steun te zoeken bij familieleden dan Vlaamse vrouwen. Overige vormen van informele steun zoeken verschilden niet significant tussen Nederland en Vlaanderen of tussen mannen en vrouwen.

Tabel 3 toont aan dat de overgrote meerderheid van de respondenten aangaf te weten wat een psychiater en psycholoog / psychotherapeut doet. Er zijn geen verschillen tussen de regio's of geslachten. Significant meer Nederlanders dan Vlamingen gaven te kennen dat ze de eerste- en tweedelijnsinstanties goed kennen. Bovendien hadden vrouwen een betere kennis van het zorgaanbod dan mannen. In Vlaanderen was de Zelfmoordlijn beter gekend dan 113 Online in Nederland.

Tabel 2 Geestelijke gezondheid, ontvangen hulp en intenties om hulp te zoeken.

	Mannen				Vrouwen			
	Nederland N=471		Vlaanderen N=778		Nederland N=760		Vlaanderen N=1075	
	%	95% B.I.	%	95% B.I.	%	95% B.I.	%	95% B.I.
Geestelijke gezondheid								
Ooit psychologische problemen gehad	36.5	(32.7-40.4)	31.9	(29.0-35.0)	51.3	(47.3-55.4)	51.6	(48.3-54.8)
Zwakke geestelijke gezondheid (SF-36<52) gedurende de afgelopen 4 weken	9.1	(7.1-11.8)	11.6	(9.8-14.0)	12.9	(10.4-15.9)	15.2	(13.1-17.8)
Ooit psychologische hulp ontvangen[a]								
Huisarts	**53.9**	**(47.3-60.4)**	**40.6**	**(35.2-46.4)**	67.4	(62.0-72.5)	58.0	(53.4-62.5)
Psychiater	20.6	(15.7-26.4)	23.2	(18.6-28.3)	22.3	(18.8-26.5)	23.4	(18.9-28.4)
Psycholoog/psychotherapeut	**49.8**	**(43.7-56.8)**	**32.4**	**(27.4-38.1)**	**63.5**	**(58.0-68.8)**	**42.6**	**(38.2-47.2)**
Medicatie	33.5	(27.7-40.2)	38.2	(32.9-44.0)	42.7	(37.1-48.2)	45.0	(40.5-49.6)
Ooit enige hulp (niet regelmatig)	**58.8**	**(51.2-66.0)**	**43.0**	**(36.9-49.4)**	64.8	(59.8-69.5)	56.4	(52.1-60.5)
Ooit in behandeling geweest	**39.7**	**(33.5-46.3)**	**27.1**	**(22.4-32.6)**	**47.6**	**(41.7-53.3)**	**33.3**	**(29.0-37.6)**
Intentie om hulp te zoeken								
Huisarts	79.6	(76.2-82.7)	74.0	(71.1-76.8)	81.7	(78.3-84.5)	81.3	(78.6-83.7)
Psychiater	**58.9**	**(54.9-62.8)**	**46.4**	**(43.1-49.6)**	**57.8**	**(53.7-61.7)**	**49.8**	**(46.4-53.0)**
Psycholoog/psychotherapeut	**74.0**	**(70.4-77.4)**	**55.7**	**(52.5-58.9)**	**80.6**	**(77.3-83.6)**	**68.0**	**(65.0-71.1)**
Medicamenteuze behandeling	**47.9**	**(43.9-51.9)**	**39.7**	**(36.6-43.0)**	50.2	(46.2-54.3)	45.9	(42.7-49.2)
Crisislijn	11.9	(9.6-14.8)	15.6	(13.4-18.1)	**12.0**	**(9.7-15.0)**	**17.4**	**(15.1-20.1)**
Steun van familie	74.9	(71.2-78.2)	74.8	(71.9-77.5)	**81.0**	**(77.6-83.9)**	**74.2**	**(71.3-77.0)**
Steun van vrienden	81.3	(77.9-84.2)	78.2	(75.4-80.7)	85.2	(82.1-87.8)	83.1	(80.6-85.5)

[a] Berekend op de respondenten die ooit psychische problemen hebben gehad

*** In het vet gedrukt: significante verschillen tussen Vlaanderen en Nederland**

Tabel 3 Kennis van geestelijke gezondheidsverstrekkers

	Mannen				Vrouwen			
	Nederland N=471		Vlaanderen N=778		Nederland N=760		Vlaanderen N=1075	
	%	95% B.I.	%	95% B.I.	%	95% B.I.	%	95% B.I.
Psychiater	81.8	(78.5-84.6)	85.3	(82.8-87.4)	87.2	(84.3-89.6)	87.8	(85.4-89.8)
Psycholoog/psychotherapeut	82.6	(79.4-85.4)	83.8	(81.2-86.0)	90.4	(87.7-92.5)	89.2	(87.1-91.1)
2de lijns geestelijke gezondheid[a]	**55.2**	**(51.2-59.1)**	**22.4**	**(19.8-25.2)**	**74.0**	**(70.4-77.4)**	**34.8**	**(31.8-38.0)**
1ste lijns psycho-sociaal welzijn[b]	**53.4**	**(49.4-57.3)**	**20.8**	**(18.3-23.5)**	**71.6**	**(67.8-75.0)**	**31.6**	**(28.7-34.7)**
Crisislijn[c]	**7.4**	**(5.6-9.8)**	**71.5**	**(68.5-74.3)**	**8.5**	**(6.5-11.0)**	**76.6**	**(73.8-79.3)**

[a] Geestelijke gezondheidsinstelling (NL) Centrum Geestelijke Gezondheidszorg (VL)

[b] Algemeen Maatschappelijk werk (NL), Centrum Algemeen Welzijnswerk (VL)

[c] 113 Online (NL), De Zelfmoordlijn (VL)

*** In het vet gedrukt: significante verschillen tussen Vlaanderen en Nederland**

Nederlandse mannen waren vaker tevreden over de zorg die ze kregen van huisartsen en psychologen/psychotherapeuten dan Vlaamse mannen (zie Tabel 4). De verschillen tussen Nederlandse en Vlaamse vrouwen zijn net niet significant. Voor beide geslachten gold dat men in Nederland meer tevreden is van de resultaten van medicatie dan in Vlaanderen.

Tabel 4 Patiënttevredenheid[ab]

	Mannen				Vrouwen			
	Nederland		Vlaanderen		Nederland		Vlaanderen	
	%	95% B.I.	%	95% B.I.	%	95% B.I.	%	95% B.I.
Huisarts	**75.5**	**(67.1-85.0)**	**59.0**	**(49.9-67.5)**	77.2	(71.0-82.5)	65.7	(59.7-71.1)
Psychiater	69.6	(55.2-80.9)	52.9	(41.2-64.3)	68.1	(56.6-77.7)	52.9	(43.3-62.3)
Psycholoog/psychotherapeut	**70.9**	**(61.8-78.6)**	**47.4**	**(37.0-57.3)**	79.5	(73.2-84.6)	67.5	(60.7-73.7)
Medicatie	**60.0**	**(48.7-70.3)**	**38.4**	**(29.9-47.6)**	**72.1**	**(63.8-79.1)**	**54.2**	**(47.3-60.9)**

a Berekend op de respondenten die ooit hulp hebben gezocht voor psychische problemen

[b] Percentage van respondenten die een score hoger dan 5 op 10 rapporteerden

*** In het vet gedrukt: significante verschillen tussen Vlaanderen en Nederland**

Suïcidale ideatie en suïcidepogingen tijdens het afgelopen jaar werden even vaak door de Nederlandse als de Vlaamse respondenten gerapporteerd (Tabel 5). Ook tussen mannen en vrouwen stelden we geen significante verschillen vast. Door de relatief kleine aantallen zijn de verschillen inzake praten over suïcide en steun ervaren niet significant. Nederlandse mannen vonden suïcide vaker aanvaardbaar en minder verwerpelijk dan Vlaamse mannen. Dit laatste verschil vonden we ook bij vrouwen. Vrouwen bleken ook vaker een gematigdere attitude ten aanzien van suïcide dan mannen te hebben. Ze vonden suïcide minder vaak aanvaardbaar maar ook minder vaak verwerpelijk.

Tabel 5 Suïcidaal verleden, praten over, steun krijgen en attitudes ten aanzien van zelfdoding

	Mannen				Vrouwen			
	Nederland		Vlaanderen		Nederland		Vlaanderen	
	%	95% B.I.	%	95% B.I.	%	95% B.I.	%	95% B.I.
Suïcidaal verleden (< 12 maanden)								
Doodswens	9,1	(7.0-11.7)	9.9	(8.0-11.9)	11.4	(9.1-14.3)	10.8	(9.5-13.7)
Suïcideplan	4.3	(3.0-6.3)	3.1	(2.2-4.5)	2.5	(1.5-4.0)	3.2	(2.2-4.6)
Suïcidepoging	0.9	(0.4-2.0)	0.6	(0.3-1.5)	0.7	(0.2-1.8)	0.6	(0.2-1.3)
Praten over en steun krijgen								
Gesproken over[a]	27.1	(20.9-34.5)	27.1	(22.1-32.6)	45.7	(38.6-53.1)	34.1	(29.1-39.8)
Steun gekregen[b]	81.4	(68.0-90.5)	68.2	(57.1-78.0)	84.8	(75.3-91.1)	72.1	(62.9-80.1)
Attidtudes t.a.z. suïcide								
Suïcide is aanvaardbaar	56.4	(**52.4-60.4**)	45.7	(**42.5-48.9**)	40.7	(38.8-46.9)	38.4	(35.2-41.7)
Suïcide is verwerpelijk	28.4	(**24.9-32.2**)	41.7	(**38.5-44.8**)	21.5	(**18.3-24.9**)	28.1	(**25.2-31.1**)

[a] Berekend op de respondenten die ooit suïcidegedachten hebben gehad.

[b] Berekend op de respondenten die ooit suïcidegedachten hebben gehad en er met iemand over gesproken hebben.

*** In het vet: significante verschillen tussen Vlaanderen en Nederland**

Discussie

We stellen vast dat het aandeel mensen met psychische problemen of een suïcidaal verleden niet verschilt tussen Nederland en Vlaanderen. Met andere woorden, ons onderzoek toont geen verschillen tussen beide regio's inzake de belangrijkste risicofactoren van suïcide. De onderzoeksresultaten tonen echter wel aan dat er opmerkelijke verschillen zijn tussen

Nederland en Vlaanderen inzake de intenties om hulp te zoeken, het krijgen van hulp, kennis van en tevredenheid over de zorg en attitudes ten aanzien van suïcide.

Ten eerste stellen we vast dat in Nederland mensen die ooit psychologische problemen hebben gehad, vaker eenmalige en langdurigere professionele hulp krijgen dan in Vlaanderen.

Ten tweede gaf ongeveer acht op de tien respondenten aan dat ze psychische hulp zouden zoeken bij een huisarts. Dit hoge percentage, dat we zowel in Nederland als in Vlaanderen vaststellen, kan er op wijzen dat de huisarts als zeer toegankelijk wordt ervaren op vlak van financiële kost, beschikbaarheid, vertrouwelijkheid, sociale aanvaardbaarheid en competenties. Het is echter opvallend dat men in Nederland vaker hulp kreeg van een huisarts voor psychische problemen dan in Vlaanderen en dit ondanks dat er meer huisartsen zijn in Vlaanderen (1 op 807 inwoners (Vlaams Agentschap Zorg & Gezondheid)) dan in Nederland (1 op 1891 (Hingstman & Kenens 2011)). Mogelijks is dit te verklaren door de poortwachterrol die de Nederlandse huisartsen opnemen. Nederlandse patiënten worden door hun zorgverzekering aangemoedigd om eerst de huisarts te consulteren die op zijn beurt de patiënt, indien nodig geacht, doorverwijst naar de gespecialiseerde geestelijke zorgverstrekkers.

Ten derde stellen we op basis van onze resultaten vast dat Nederlanders vaker de intentie hebben om een psychiater te raadplegen. Desalniettemin zien we ook dat het aandeel mensen dat ooit psychische problemen heeft gehad en dat hulp heeft gekregen van een psychiater even hoog is in Nederland als in Vlaanderen. Dit staat in contrast met de verkregen hulp van een psycholoog/psychotherapeut. Dit was significant hoger in Nederland dan in Vlaanderen. Mogelijk kan dit verschil verklaard worden door de organisatie van de gezondheidszorg. De poortwachterfunctie in Nederland is geassocieerd met meer aandacht van de huisarts voor de psychosociale problematiek van de patiënt, maar niet met de tijd die de huisarts besteedt aan de communicatie hierover (Verhaak, 2007). De Nederlandse huisarts zou echter vaker doorverwijzen naar gespecialiseerde zorgverstrekkers dan Belgische (vergelijkende data voor Vlaanderen alleen zijn niet beschikbaar) huisartsen (Kovess-Masfety e.a., 2007). Bovendien is in Nederland psychotherapie dankzij de verplichte basisverzekering beter terugbetaald dan in Vlaanderen. In Vlaanderen wordt psychotherapie terugbetaald als deze wordt voorzien door een psychiater, of deels terugbetaald door enkele zorgkassen of tegen een relatief lage vergoeding via een Centrum voor Geestelijke Gezondheidszorg of Centrum Algemeen Welzijnswerk. Hierdoor zijn Nederlandse huisartsen en patiënten minder gehinderd om door te verwijzen naar of te kiezen voor een psychotherapeut. Dit zou dus kunnen verklaren waarom enerzijds Vlaamse patiënten, ondanks hun lagere intentie, toch even vaak hulp krijgen van een psychiater dan Nederlandse patiënten en anderzijds men in Nederland vaker geneigd is om hulp te zoeken bij een psychotherapeut.

Ten vierde tonen onze resultaten aan dat, niettegenstaande men in Nederland meer professionele hulp kreeg, er geen significant verschil was inzake het gebruik van medicatie. Dit zou opnieuw een gevolg kunnen zijn van de organisatie van de zorg, waarbij de Vlaamse patiënt verhoudingsgewijs vaker hulp krijgt via de huisarts en de psychiater, terwijl men in Nederland vaker hulp krijgt van een psychotherapeut. Een andere mogelijke verklaring is dat men in Nederland een andere copingstijl heeft, waarbij de patiënt via gesprekstherapie meer actief participeert in het behandelingsproces en de Vlaamse patiënt vaker een medicamenteuze aanpak verkiest. Een derde verklaring is mogelijks te zoeken bij de ervaren stigma. Eerder onderzoek in Vlaanderen en Nederland toonde aan dat Vlamingen meer zelfstigma en schaamte ervaren

indien ze psychische hulp zouden zoeken (Reynders e.a., 2014). Het stigma en de schaamte bleken echter sterk geassocieerd te zijn met hulp zoeken bij een arts, psychiater of psychotherapeut, maar niet met medicatiegebruik.

Een vijfde vaststelling betreft de kennis van de zorgsector. Psychiaters en psychologen/psychotherapeuten zijn zowel in Nederland als in Vlaanderen en zowel bij mannen als bij vrouwen goed gekend. Kijken we naar de eerste- en tweedelijnszorg, dan zien we dat minder dan een op drie Vlamingen vertrouwd is met een Centrum voor Geestelijke Gezondheidszorg of Centrum Algemeen Welzijnswerk. In Nederland zijn deze percentages dubbel zo hoog. Een gebrek aan kennis is een belangrijke drempel om daadwerkelijk hulp te zoeken. Dit is in het bijzonder problematisch als het gaat om eerstelijnszorg die laagdrempelig hoort te zijn. De crisislijnen waren dan weer veel beter gekend in Vlaanderen dan in Nederland. Dit komt wellicht omdat in Vlaanderen relatief veel geïnvesteerd werd in de bekendheid van de Zelfmoordlijn, terwijl 113 Online in Nederland een vrij recent initiatief is. Dit verschil in bekendheid vertaalt zich ook in een hoger percentage Vlamingen dat de intentie heeft om deze diensten te contacteren, in het bijzonder bij vrouwen.

Ten zesde zien we dat de tevredenheid globaal genomen beter is in Nederland dan in Vlaanderen. Dit is mogelijk geassocieerd met het groter aandeel langdurigere behandelingen in Nederland in vergelijking met Vlaanderen. Enerzijds is een hogere tevredenheid geassocieerd met een betere therapietrouw. Anderzijds kunnen we stellen dat een te weinig aantal consultaties leidt tot minder effectieve hulpverlening.

Tenslotte stellen we vast dat, tegen de hypothese in, Nederlanders meer aanvaardende en minder verwerpende attitudes hebben ten aanzien van suïcide. Een mogelijke verklaring is dat de negatieve attitudes wijzen op een onderdrukking en ontkenning van suïcidale gedachten in een culturele context waarin suïcide minder aanvaard wordt en waar psychische hulp zoeken meer beladen is met stigmatiserende attitudes (Renberg e.a. 2008).

Beperkingen van het onderzoek

Bij de interpretatie van het onderzoek moeten ook enkele beperkingen voor ogen gehouden worden. Ten eerste betreft het een cross-sectioneel onderzoek waarbij we de populatie van twee regio's met elkaar vergelijken. We kunnen dus geen conclusie trekken inzake de causaliteit van relaties. Ten tweede betreft het onderzoek de algemene bevolking tussen 18 en 64 jaar. We kunnen de resultaten dus niet extrapoleren naar jongeren of ouderen. Een derde beperking betreft de relatief lage en ongelijke responsgraad van 27%. in Nederland en 41% in Vlaanderen. Dit betekent dat de resultaten niet in gelijke mate representatief zijn, wat kan leiden tot een vertekend beeld. Een mogelijke verklaring is het gebruik van een postenquête die vaker een lagere responsgraad geeft dan bijvoorbeeld face-to-face interviews. Bovendien kan het onderwerp van het onderzoek gevoelig liggen of confronterend zijn, waardoor mensen minder snel geneigd zijn om te participeren. Een voordeel is wel dat deze bevragingsmethode zeer anoniem is en minder sociaal wenselijke antwoorden opwekt. Ten vierde moet de validiteit van attitudes ten aanzien van suïcide beter onderzocht worden. De reden waarom de onderzoekers een nieuwe schaal ontwikkelden, is omdat tot op heden geen enkele suïcide-attitudeschaal voldoende valide en betrouwbaar is. Bovendien bevatten deze schalen geen items over het al

dan niet laf of egoïstisch vinden van suïcide, terwijl de onderzoekers van mening zijn dat dit twee vaak voorkomende opinies zijn.

Conclusies

De resultaten van dit onderzoek laten ons toe om een vergelijking te maken tussen Nederland en Vlaanderen inzake risico- en beschermende factoren van suïcide. Het voorkomen van psychische problemen en suïcidale gedachten verschilde niet tussen Nederland en Vlaanderen. Het verschil in steun zoeken en krijgen voor suïcidale gedachten was hoger in Nederland dan in Vlaanderen, maar dit verschil was slechts randsignificant. De attitudes ten aanzien van suïcide waren positiever in Nederland dan in Vlaanderen en dit verschil was grotendeels significant. Voor de meeste vormen van hulpverlening gold dat men in Nederland vaker de intentie had om hulp te zoeken, vaker hulp had gekregen voor psychische problemen, men meer tevreden was over de verkregen hulp en men een betere kennis had van de eerste- en tweedelijns zorginstanties in vergelijking met Vlaanderen. We zijn ons bewust dat we geen causaal verband kunnen leggen tussen deze bevindingen en de verschillen in suïcidecijfers. Desalniettemin tonen onderzoeken aan dat deze factoren belangrijke beschermende factoren voor suïcide zijn. Globaal kunnen we uit onze resultaten besluiten dat Nederland en Vlaanderen niet zo zeer verschillen met betrekking tot de aanwezigheid van risicofactoren maar wel wat de beschermende factoren betreft.

Deze resultaten sluiten aan bij recent gepubliceerd onderzoek op basis van dezelfde dataset waaruit blijkt dat, in vergelijking met Vlamingen met een suïcidaal verleden, Nederlanders met een suïcidaal verleden vaker positievere attitudes hebben ten aanzien van hulp zoeken en vaker de intentie hebben om hulp te zoeken (Reynders et al, 2015). Ander gerelateerd onderzoek vond dat de mate van ervaren schaamte en zelfstigma ten gevolge van hulpzoeken positief en de sterkte van de intentie om informele hulp te zoeken negatief geassocieerd zijn met regionale suïcidecijfers in Nederland en Vlaanderen (Reynders et al., 2015).

Beschermende factoren kan men bijsturen door middel van een beleid dat gericht is op het bevorderen van de bekendheid van het zorgaanbod, het verlagen van de drempels om professionele en informele hulp te zoeken voor psychische problemen en het afstemmen van de zorg op de noden van de cliënt met het oog op de tevredenheid over en de kwaliteit van de zorg. Hierbij kan men inzetten op de organisatie van de zorg, zoals een betere beschikbaarheid van adequate psychologische zorg, maar ook op attitudes die hulp zoekend gedrag voor psychische problemen bevorderen. Toekomstig onderzoek is echter nodig om de relatie tussen de organisatie van de zorg, hulp zoeken voor psychische problemen en suïcide beter te begrijpen. Crossnationaal onderzoek kan hiertoe bijdragen. Daarnaast is er bijkomend longitudinaal onderzoek nodig voor een beter begrip van de relatie tussen attitudes en suïcide.

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5. Paper 5

Attitudes and stigma in relation to help - seeking intentions for psychological problems in low and high suicide rate regions.

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Keywords*: Attitudes, stigma, help-seeking, suicide, cross-national research.*

Purpose *Accessibility and availability of mental health care services are necessary but not sufficient for people to seek help for psychological problems. Attitudes and stigma related to help seeking also determine help seeking intentions. The aim of this study is to investigate how cross-national differences in attitudes and stigma within the general population are related to professional and informal help seeking intentions in low and high suicide rate regions.*
Methods *By means of a postal structured questionnaire, data of 2999 Dutch and Flemish respondents between 18 and 65 years were gathered. Attitudes toward help seeking, perceived stigma, self-stigma, shame and intention to seek help were assessed.*

Results *People in the Netherlands, where suicide rates are low, have more positive attitudes toward help seeking and experience less self stigma and shame compared to the people in Flanders, where suicide rates are relatively high. These attitudinal factors predicted professional as well as informal help seeking intentions. Perceived stigma was negatively associated with informal help seeking. Shame was positively associated with higher intention to use psychotropic drugs and perceived stigma was negatively associated with the intention to seek help from a psychotherapist in Flanders but not in the Netherlands.*

Conclusion *Help seeking for psychological problems prevent these problems to aggravate and it is assumed to be a protective factor for suicide. Our results stress the importance of the promotion of positive attitudes and the reduction of stigma within the general population to facilitate help seeking from professional providers and informal networks. Focusing on these attitudinal factors is believed to be a key aspect of universal mental health and suicide prevention policies.*

Introduction

People with psychological problems often experience many barriers for seeking help, resulting in high rates of unmet need [1;2]. Seeking help is important to prevent psychological problems to aggravate and even to reduce the risk of suicide [3]. Structural factors, such as the organization of mental health care, are important determinants for seeking psychological help. However, accessibility and availability are necessary but not sufficient for people to actually seek help. The attitudes and stigma people hold in relation to mental health and help seeking are also important barriers [4]. Therefore, the aim of this study is to investigate how cross-national differences in attitudes and stigma within the general population are related to professional and informal help seeking intentions in low and high suicide rate regions.

A positive attitude toward a behavior such as help seeking is associated with a stronger intention to act upon this attitude. According to behavioral theories, intentions are immediate antecedents of actual behavior [5]. Various studies found an association between positive attitudes and help seeking intentions [6-8] and actual service use [9]. Stigma comprises a negative reaction of a substantial part of the general public toward a group of people because of their characteristics (e.g., a psychological problem) or behavior (e.g. help seeking). Stigma contains three essential aspects. The first aspect is negative beliefs or *stereotypes* such as 'people with psychological problems are incompetent'. Second, there is the aspect of *prejudice*. This is the agreement of most of the people with these stereotypes and/or the experience of negative emotional reactions such as fear or anger toward the stigmatized group. Third, there is the behavioral response to prejudice resulting in *discrimination* and thus the need for social distance [10]. A key concept in the process of stigmatization is labeling. From the moment one is labeled and thus identified as a member of the stigmatized group, he risks being prejudged and discriminated. Furthermore, research found that depressed people were more often stigmatized when they seek help than those who did not [11]. A way for people with psychological problems to prevent being labeled is secrecy or not seeking help.

In this article, we distinguish between two types of stigma. First, perceived stigma refers to the stigmatizing attitudes and discriminating behavior one observes in his environment toward people who have received psychological help [12]. A review of studies among young people found a relation between perceived stigma and a weaker intention to seek help [13]. Nevertheless, recent studies found no direct relation between perceived stigma and professional help seeking [6;8;14;15]. One explanation is that perceived stigma was not directly related to help seeking intentions because it was mediated by attitudes toward help seeking and self-stigma [6;8]. Second, there is the belief of people that seeking help can be kept secret to others. If so, they should not fear being stigmatized if they did [15]. However, secrecy is not a valid coping strategy to avoid labeling by others when seeking help within the informal network. In a qualitative study, stigma was the most commonly mentioned disadvantage of seeking help from family and friends [16]. Therefore we will include informal help seeking in our analysis.

Self-stigma, the second type of stigma in this article, is the internalizing of the stigmatizing attitudes toward people who seek help for psychological problems [10]. People who experience self-stigma will turn the stigmatizing attitudes, such as incompetence, against themselves resulting in a loss of self – efficacy, self-esteem and non-participation in society [17]. Many studies found a negative correlation between self-stigma and help-seeking intentions [6;8].

Although closely related to self-stigma, few studies investigated the relation of shame for help seeking for psychological problems and willingness to seek help. Barney and colleagues found that embarrassment was associated with lower help-seeking intentions [18]. Besides the indirect relation between stigma and shame and suicide via help seeking intentions and behavior, it has been suggested that stigma and shame create distress which people, who already have psychological problems, must overcome. Therefore stigma is not only an important barrier for help seeking but it is also a more direct risk factor for suicide [19;20].

The above mentioned attitudes and stigma are not merely individual constructs. Research found not only that attitudes differ between regions, but also that there is an association between the individual attitudes and the societal attitudes of the region [21]. Furthermore, research found that in countries characterized by less stigmatizing attitudes and more help seeking intentions, people with a mental illness experienced less self-stigma and perceived less discrimination [22]. Therefore, socio-cultural factors such as attitudes and belief systems prevalent in a society, determine the way people think about and cope with psychological problems [23].

These attitudinal factors are possibly even more important for understanding differences in help seeking between populations of regions where structural barriers to help seeking are comparable. This is illustrated by the case of the Netherlands and Flanders. Although historical, religious and cultural differences are noticeable, both neighboring regions do also resemble with respect to their socio - demographic, economic, linguistic and geographic features. Moreover, the prevalence of mental disorders is comparable in both regions [24]. Furthermore, both regions are known for their well-developed mental health care and social security systems although the mental health care is organized differently. For example the number of general practitioners, psychiatrists and psychologists per 100,000 population is higher in Belgium than in the Netherlands [25]. The number of beds in mental health hospitals is higher in Belgium but the number of outpatient facilities is higher in the Netherlands [26]. In the Netherlands, people are obliged to have a private basic care insurance but in return specialized mental health care is better reimbursed. In contrast to their Flemish counterparts, Dutch general practitioners have a gate keeping function and there are explicit directives for a multidisciplinary mental health care approach resulting in higher rates of referral from general practitioners to mental health specialists in the Netherlands [25]. The Flemish government has a suicide prevention action plan including initiatives for reducing stigma of mental illness while the Netherlands is lacking a comparable nation wide policy [27]. In addition, both regions differ remarkably with respect to the way people cope with psychological problems. The suicide rates are about eighty percent higher in Flanders. Over the period 2005 – 2010, the age standardized suicide rate for Flemish men is 22.9/100.000 inhabitants and for women 8.7 [28]. In the Netherlands, the suicide rates for the same period are 12.0 and 5.2 respectively [29]. Furthermore, a previous study on seeking help for psychological problems found that Dutch people were more inclined to seek specialized help for psychological problems than Belgian people. Although the differences in help seeking could partially be explained by organizational factors, it is also suggested that attitudinal factors too could play a prominent role [25].

Building further on these observations, the aim of this study is to investigate 1) if there are differences in help seeking related attitudes and stigma between the general populations of low and high suicide rate regions and 2) if there is an association within the general population between these attitudinal factors on the one hand and the intention to seek professional and

informal help when confronted with psychological problems on the other hand. We hypothesize that in the Netherlands, where suicide rates are lower, attitudes toward help seeking are more positive and perceived stigma, self-stigma and shame related to help seeking are less prevalent than in Flanders. Furthermore, we hypothesize that positive attitudes toward help seeking are positively related to the intention to seek professional and informal help and perceived stigma, self-stigma and shame are negatively related to the intention to seek professional and informal help. In addition, research found that being female and higher education was associated with more positive attitudes toward help seeking [9], less perceived stigma [14;30] and less self-stigma [22]. Being unemployed was associated with more perceived stigma [30] and more self-stigma [22]. Having psychological problems and previously received help was associated with more positive attitudes toward help seeking [9;31] while psychological problems was also found to be related to more perceived stigma [14]. Because of these associations, we will also include these variables in our analysis.

Methods

Study sample

The target population for this study is the general population of Flanders and the Netherlands between 18 and 65 years old with the Belgian and the Dutch nationality, respectively. For the selection of the sample units, we made use of a cluster sample combined with systematic sampling [32]. The result is a random, geographically well spread and representative sample. The Dutch sample contains 4550 individuals out of 38 municipalities, out of 8 COROP regions and 7 provinces. In Flanders the outcome of this procedure was 4550 individuals, out of 52 municipalities, out of 12 care regions and 5 provinces.

Procedure

The systematic sample of individuals was selected out of the official population registered by the authorities. The selected individuals received a structured postal questionnaire together with a guided letter. The letter informed the participants about the goal of the research, the voluntariness of participation and the anonymity of the study. The response rate was 27.4% (The Netherlands) and 41.4% (Flanders). In total, we gathered data of 2999 Dutch and Flemish participants. The sample was weighted for age, gender, and marital status based on demographic data from the Netherlands and Flanders to match population distributions and to compensate for the moderate response rate.

Instruments

Demographic variables. The survey included questions about age, gender, years of schooling, civil state and employment.

Mental health. This was measured by the five item mental health summary scale (MH) from the 36-Item Short-Form Health Survey (SF-36) [33]. Scores range from 0 to 100. High scores indicate better mental health. In the SF-36 MH, scores $\leq$ 52 indicate emotional problems probably of any psychiatric disorder [33]. Reliability and validity are well established. Reliability for MH scores usually exceed 0.90 [33]. In our sample, Cronbach's alpha was 0.85. The five items were: how much of the time during the **past 4 weeks** have you been a very nervous person?; Have you felt so down in the dumps that nothing could cheer you up?; Have you felt calm and peaceful?; Have you felt downhearted and blue?; Have you been a happy

person? The six response choices were: all of the time, most of the time, a good bit of the time, some of the time, a little of the time, none of the time.

Intention to seek help. This was measured by six items which were created for this study. The respondents were asked whether they would seek help from a general practitioner, psychiatrist, psychotherapist, friends or family if they were confronted with psychological problems.

Furthermore, the respondents were asked whether they are willing to use psychotropic drugs.

Passive coping. Respondents were asked if they would do nothing hoping that the psychological problems would disappear out of their own. This item was based on the Utrecht Coping scale [34].

History of professional help seeking. By means of a single yes/no item, respondents were asked whether they had ever received help for psychological problems from a general practitioner, a psychotherapist or a psychiatrist.

Self-stigma was measured by the Self-Stigma of Seeking Help-Scale (SSOSH) [35]. The scale has a uni-dimensional factor structure and consists of 10 items such as "Seeking psychological help would make me feel less intelligent". The internal consistency of the scale ranged between .86 to .90. In our sample, Cronbach's alpha was .85. The instrument was dichotomized by expressing the scores on a scale from 0-100. A score higher than 50 indicates that the respondent agreed that they would experience self-stigma for seeking psychological help.

For *Shame for seeking help* we developed three six – point Likert items. The items were: 'I would prefer that my neighbors did not know if I would receive help for psychological problems', 'I would be ashamed if I needed help for psychological problems' and 'I would keep it for myself if I would receive help for psychological problems'. The internal consistency of the three items was .80. The instrument was dichotomized by expressing the scores on a scale from 0-100. A score higher than 50 indicates that the respondent agreed that they would feel ashamed if they would sought psychological help.

Perceived stigma was measured by the Perceived Devaluation- Discrimination-scale [36]. The scale was developed as a one-dimensional scale containing 12 items such as "Most people feel that entering a mental hospital is a sign of personal failure". The average internal consistency is .78 and the scale shows good construct validity through a relationship with internal experience of demoralization and lower self-esteem [37]. In this study, the internal consistency was .85. The instrument was dichotomized by expressing the scores on a scale from 0-100. Scores higher than 50 indicate respondents who in general agreed that most people had stigmatizing attitudes toward psychiatric patients.

Attitudes toward help seeking was measured by Attitudes toward Seeking Professional Psychological Help- scale (Short form) and it was developed to measure mental health treatment attitudes. This scale was designed as a one-dimensional 10 item scale [38]. Test – retest reliability (.80), and internal consistency (.84) were good. [39]. In our sample, Cronbach's alpha was .81. The instrument was dichotomized by expressing the scores on a scale from 0-100. Scores higher than 50 indicate that the respondents had overall positive attitudes.

Analysis

First, weighted percentages and 95% confidence intervals were presented. Next, associations between the attitudinal variables are presented by the zero – order correlations together with the level of significance. Multiple logistic regression was used to analyze the association between on the one hand socio-demographic variables, previously received help and mental

well-being and on the other hand the attitudinal variables. Adjusted odds ratios and level of significance are presented. Finally, the relations between attitudinal factors and variables measuring professional and informal help seeking intentions were calculated by means of multiple logistic regression analysis. The odds ratios were adjusted for the demographic variables age, education level, marital status and employment status and for previously received help and mental well-being. For the analysis SPSS 16.02.2 was used.

Results

Table 1 shows that the majority of people have positive attitudes toward help seeking. Dutch people have more often positive attitudes toward help-seeking and they would be less often ashamed for seeking-help than Flemish people. Between 13 and 28% of the respondents would experience self-stigma if they would seek professional help for psychological problems. About 7 out of then perceive stigmatizing attitudes by others.

Table 2 gives the zero-order correlates between the different attitudinal variables. Positive attitudes correlates negatively with self-stigma and shame. A strong correlation was found between self-stigma and shame. These two variables correlated weakly but significantly with perceived stigma.

Table1 Percentage of Dutch and Flemish men and women who have positive attitudes toward professional help seeking, perceived stigma, experience self-stigma and shame for professional help seeking (weighted percentages and 95% C.I.)

	Men				Women			
	Netherlands N=471		Flanders N=778		Netherlands N=760		Flanders N=1075	
	%	95% C.I.	%	95% C.I.	%	95% C.I.	%	95% C.I.
Positive attitudes toward help seeking	73.9	**(70.9-77.4)**	62.9	**(59.7-66.0)**	85.2	**(82.1-88.0)**	75.4	**(72.5-78.2)**
Self-stigma for help seeking	21.5	(21.7-28.7)	27.7	(24.8-30.7)	13.3	**(10.7-16.2)**	23.3	**(20.7-26.3)**
Shame for help seeking	59.6	**(55.4-63.4)**	68.2	**(65.1-71.1)**	47.0	**(43.0-51.1)**	65.2	**(62.3-68.7)**
Perceived stigma	70.3	(66.5-73.9)	68.9	(65.7-71.8)	70.2	(66.4-73.9)	73.2	(70.2-76.0)

***C.I.'s in bold indicate significant differences between the regions**

Table 2 Zero-order correlations between the attitudinal variables

variable	1		2		3		4	
			r	p	r	p	r	p
1 Positive attitudes toward help seeking	-	-	-.543	<.001	-.328	<.001	-.006	.737
2 Self-stigma for help seeking			-	-	.586	<.001	.146	<.001
3 Shame for help seeking					-	-	.205	<.001
4 Perceived stigma							-	-

Table 3 Socio-demographic factors, mental health and help seeking in relation to socio-cognitive factors within the Netherlands and Flanders. Adjusted* odds ratios and level of significance

	Attitudes prof. help - seeking			Self - stigma		
	OR	95% CI	P	OR	95% CI	P
Gender						
Men	1.00		-	1.00		-
women	1.66	(1.38-1.98)	**<.001**	0.73	(0.60-0.88)	**.001**
Age category						
18-34	1.00		-	1.00		-
35-49	0.86	(0.68-1.08)	.190	0.71	(0.56-0.90)	**.004**
50-64	0.87	(0.68-1.13)	.311	0.54	(0.41-0.71)	**<.001**
Married	0.76	(0.62-0.93)	**.008**	0.95	(0.77-1.17)	.600
Education						
Low (secondary school)	1.00		-	1.00		-
Medium (high school)	0.99	(0.77-1.28)	.938	1.05	(0.80-1.39)	.709
High (college or university)	1.60	(1.23-2.08)	**<.001**	0.87	(0.66-1.15)	.332
Unemployed	1.01	(0.62-1.62)	.984	0.69	(0.40-1.19)	.184
Region						
Netherlands	1.00		-	1.00		-
Flanders	0.58	(0.48-0.70)	**<.001**	1.56	(1.28-1.91)	**<.001**
Mental health and help seeking						
Lower self-ratings of mental health (SF-36 <52)	0.98	(0.73-1.32)	.894	1.67	(1.26-2.22)	**<.001**
Previously received any help from a GP, psychiatrist or psychotherapist	2.32	(1.87-2.87)	**<.001**	0.65	(0.53-0.81)	**<.001**

*** Odds ratios are adjusted for all the variables in the left column**

P values in bold indicate significance at <.05

Table3 Continued

	Shame			Perceived stigma		
	OR	95% CI	P	OR	95% CI	P
Gender						
Men	1.00		-	1.00		-
women	0.82	(0.70-0.96)	**.014**	1.09	(0.92-1.29)	.345
Age category						
18-34	1.00		-	1.00		-
35-49	0.71	(0.58-0.87)	**.001**	1.06	(0.84-1.32)	.637
50-64	0.55	(0.44-0.69)	**<.001**	0.65	(0.51-0.82)	**<.001**
Married	1.02	(0.86-1.22)	.819	1.04	(0.86-1.26)	.691
Education						
Low (secondary school)	1.00		-	1.00		-
Medium (high school)	0.90	(0.71-1.13)	.350	1.34	(1.05-1.70)	**.017**
High (college or university)	0.86	(0.68-1.08)	.198	1.40	(1.10-1.78)	**.006**
Unemployed	0.84	(0.55-1.28)	.410	1.10	(0.69-1.76)	.679
Region						
Netherlands	1.00		-	1.00		-
Flanders	1.73	(1.47-2.03)	**<.001**	1.06	(0.89-1.26)	.501
Mental health and help seeking						
Lower self-ratings of mental health (SF-36 <52)	1.73	(1.33-2.26)	**<.001**	1.65	(1.22-2.23)	**.001**
Previously received any help from a GP, psychiatrist or psychotherapist	0.69	(0.58-0.82)	**<.001**	1.20	(1.00-1.45)	0.53

Table 4 Association between socio-cognitive factors and intention to seek help for psychological problems. Adjusted* odds ratio's and level of significance.

		GP			Psychiatrist		
		OR	95% CI	P	OR	95% CI	P
Positive attitudes toward professional help seeking	NL	2.56	(1.74-3.75)	**<.001**	4.17	(3.00-5.99)	**<.001**
	FL	1.75	(1.36-2.31)	**<.001**	4.00	(3.11-5.00)	**<.001**
Self-stigma for professional help seeking	NL	0.44	(0.32-0.65)	**<.001**	0.52	(0.37-0.72)	**<.001**
	FL	0.53	(0.41-0.89)	**<.001**	0.47	(0.37-0.59)	**<.001**
Shame for professional help seeking	NL	0.46	(0.32-0.65)	**.001**	0.64	(0.49-0.82)	**.001**
	FL	0.68	(0.51-0.89)	**<.001**	0.60	(0.49-0.74)	**<.001**
Perceived stigma	NL	0.81	(0.55-1.17)	.258	0.79	(0.60-1.04)	.095
	FL	0.97	(0.73-1.28)	.823	0.81	(0.65-1.01)	.065
Region							
Netherlands		1.00		***	1.00		***
Flanders		0.81	(0.67-1.10)	**.045**	0.66	(0.57-0.78)	**<.001**

*** Odds ratios are adjusted for all the variables include in Table 3**

P values in bold indicate significance at <.05

Table 4 Continued

		Therapist			Psychotropic drugs		
		OR	95% CI	P	OR	95% CI	P
Positive attitudes toward professional help seeking	NL	5.56	(3.94-7.93)	**<.001**	2.50	(1.81-3.53)	**<.001**
	FL	5.00	(4.00-6.37)	**<.001**	2.33	(1.85-2.25)	**<.001**
Self-stigma for professional help seeking	NL	0.43	(0.30-0.61)	**<.001**	0.93	(0.66-1.29)	.646
	FL	0.34	(0.27-0.43)	**<.001**	0.98	(0.78-1.25)	.902
Shame for professional help seeking	NL	0.39	(0.28-0.54)	**<.001**	1.11	(0.86-1.41)	.416
	FL	0.44	(0.35-0.55)	**<.001**	1.43	(1.15-1.78)	**.001**
Perceived stigma	NL	0.78	(0.84-1.09)	.146	0.86	(0.65-1.13)	.283
	FL	0.75	(0.59-0.94)	**.013**	0.87	(0.70-1.09)	.228
Region							
Netherlands		1.00		***	1.00		***
Flanders		0.48	(0.40-0.57)	**<.001**	0.76	(0.65-0.89)	**0.004**

Table 4 continued

		Passive coping			Family			Friends		
		OR	95% CI	P	OR	95% CI	P	OR	95% CI	P
Positive attitudes toward professional help seeking	NL	0.50	(0.34-0.73)	**<.001**	1.49	(1.02-2.16)	**<.040**	1.05	(0.68-1.63)	.826
	FL	0.70	(0.54-0.91)	**.007**	1.59	(1.23-2.03)	**<.001**	1.08	(0.81-1.43)	.623
Self-stigma for professional help seeking	NL	2.27	(1.56-3.33)	**<.001**	0.51	(0.35-0.75)	**.001**	0.58	(0.38-0.90)	.014
	FL	1.45	(1.12-1.88)	**.006**	0.67	(0.52-0.87)	**.003**	0.85	(0.63-1.15)	.311
Shame for professional help seeking	NL	2.27	(1.62-3.25)	**<.001**	0.58	(0.43-0.81)	**.001**	0.46	(0.32-0.66)	**<.001**
	FL	2.44	(1.84-3.32)	**<.001**	0.63	(0.49-0.81)	**<.001**	0.65	(0.49-0.87)	**.002**
Perceived stigma	NL	1.18	(0.82-1.69)	.373	0.63	(0.44-0.91)	**.013**	0.86	(0.58-1.27)	.447
	FL	1.09	(0.83-1.43)	.529	0.65	(0.50-0.86)	**.002**	0.94	(0.70-1.26)	.679
Region										
Netherlands		1.00		***	1.00		***	1.00		***
Flanders		1.16	(0.95-1.41)	0.137	0.80	(0.66-0.96)	**0.018**	0.82	(0.66-1.01)	0.062

Table 3 shows that women, unmarried and higher educated people, and people who previously received professional help have more positive attitudes toward help seeking. Self-stigma and shame was more often experienced by men, younger adults, people with lower self-ratings of

mental health and those who have never received help for psychological problems. Public stigma were more often observed by younger adults, higher educated people and people with lower self-ratings of mental health. Dutch people are characterized by more positive attitudes, less self-stigma and shame compared to Flemish people. Positive attitudes toward help seeking was positively related to the intention of seeking help from a general practitioner, psychiatrist, psychotherapist and family (Table 4). Self-stigma and shame were negatively related to the intention to seek help from these providers

Perceived stigma was associated with less willingness to seek help from a psychotherapist (in Flanders) and informal help from family members. We performed an additional analysis to find out if the relation between perceived stigma and the intention to seek help was mediated by self-stigma, shame and attitudes toward help seeking. The result was that the relation remained significant for informal help seeking from family in Flanders (OR 0.72, $p = .024$) but not in the Netherlands (OR 0.72, $p = .091$) nor for the intent to seek help from a therapist in Flanders (OR 0.96, $p = .741$). A passive coping style was negatively related to positive attitudes toward help seeking and positively with self-stigma and shame. Shame for seeking professional help decreases the intention to seek help from family or friends. Finally, shame was positively related to the intention to use psychotropic drugs, but only in Flanders.

Limitations

Some limitations should be considered when interpreting the results of this study. The response rate is moderate. A review of response rates in academic studies using mail surveys found an average of 55.6% and a standard deviation of 19.7 [40].This can be explained by the strong emotional connotation of the research subject. Furthermore, subjects are less compelled and encouraged to participate when contacted by mail than in the case of for example a telephone survey. On the other hand, a postal survey creates more security and anonymity, making participants less restrained to respond more sincerely [41]. Closely related with the previous point, the response rate in the Netherlands was lower than in Flanders. The research project was an initiative of a Belgian research team and this was communicated to all potential participants. Participating and resending personal and delicate information across the border could be a barrier for the Dutch population. To obviate these limitations, weighted adjustments were done to represent population distributions. Third, the research sample includes only participants between 18 and 65 years old. Therefore, our results cannot be generalized to teenagers and the elderly. Moreover, we added a three-item scale for shame for help seeking which was developed for this study. Although internal consistency was good, and there was a moderate correlation with the self-stigma scale suggesting discriminant validity, more validity tests should be conducted. Furthermore, the authors acknowledged the importance of cultural factors and structural characteristics of the mental health organization of both regions, but our study design did not allow us to incorporate these variables in our analysis. Therefore, future research should be undertaken to investigate the role of structural and cultural factors on help seeking for psychological problems. Next, the data in our research are cross-sectional. As a result, we could not investigate causal relations between the dependent and independent variables, but only associations. In addition, our dependent variables were intentions to seek

help. Although, intentions are close antecedents of actual help seeking behavior, considerable variability in correlations between intentions and actual behavior were observed.

Discussion

In general, we can conclude that all hypotheses were confirmed. In the Netherlands where people were more inclined to consult a general practitioner, a psychiatrist or a psychotherapist, positive attitudes were more prevalent and self-stigma and shame less prevalent in comparison to Flemish people. Furthermore, we found a clear relation between attitudes and stigma on the one hand and intention to seek help on the other hand. These results indicate that besides organizational factors such as availability and accessibility of mental health care services, also attitudinal factors play a key role in help seeking intentions. People are inclined to adopt the predominant attitudes and belief systems of the community resulting in a mentality more or less prone to seek help for psychological problems [21,22]. However, it is also plausible that there is an interaction between the organization of the mental health care and attitudinal factors. The organization of the Dutch mental health care differs in some respects from the Flemish health care. For example, compared with the Flemish situation, Dutch general practitioners have a more pronounced gate keeping function, resulting in more references to specialized mental health care. Furthermore, Dutch general practitioners cooperate more closely with psychologists and social workers. Additionally, psychotherapy is better reimbursed in the Netherlands than in Flanders [25]. These structural factors facilitate specialized help seeking, making Dutch people more acquainted with specialized health care and help seeking for psychological problems. This could translate itself in a more open attitude toward help seeking, less self-stigma, less shame and at the end, stronger intentions to seek help for psychological problems.

With regard to perceived stigma we found no difference between the two populations but in contrast to some recent studies [6;8;15], we did find a relation between perceived stigma and the intention to seek help from a psychotherapist but only in Flanders. Interestingly, we found also a negative relation between perceived stigma and the intention to seek help from family members. Perceived stigma implies that people fear being labeled as mentally ill and as a result fear discrimination. However, it is assumed that if people believe they can keep their help seeking secret to others, there is no reason to fear discrimination and thus is perceived stigma no longer a barrier to seek help. But in the case of informal help seeking, the ones seeking help from and those having stigmatizing attitudes, coincide. Keeping help seeking a secret becomes difficult if not impossible. This relation was not found for seeking help among friends. Possibly, one can choose the friends to whom it is safe to disclose one's problems without fearing being stigmatized. As in other studies [6;8], we did not find an association between perceived stigma and attitudes toward the intention to seek help. This suggests that what one thinks about help seeking and what is believed others think about people who need help, is not per se related. We did find a correlation between perceived stigma and self-stigma and shame. This is in line with the modified labeling theory which states that perceived stigma can result in self-stigma when people are felt being labeled as mentally ill [12]. Our results suggest that this process is also anticipated by the general population without having psychological problems or being labeled as such.

Although our data show that there is a moderate correlation between self - stigma and shame, we also ascertain that shame is two to three times more common than self - stigma. Furthermore, our data indicate also that people being ashamed for others to know that they sought professional help, are also more reluctant to seek help from friends and family. It is therefore believed that shame is a strong emotional reaction to stigma and that it is an important barrier for seeking professional as well as informal help. Moreover, shame, although associated with less intention to seek help, was found to be positively associated with the intention to consume psychotropic drug among Flemish people. Possibly, shame is mainly associated with consulting mental health providers but not with treatment itself. At least, if it can be undergone in a discrete way, which is the case for psychotropic drug treatment but less for psychotherapy. This is in line with our observation that perceived stigma is only in Flanders negatively associated with willingness to seek counseling from a psychotherapist. This possibly adds to the explanation why in Flanders the consumption of psychotropic drugs is higher [42] and the intention to seek help weaker than in the Netherlands [25].

Another interesting observation is that attitudes toward help seeking, self-stigma and shame are not only associated with help seeking intentions but also with a passive coping style.

Finally, the regions subject to our study, although resembling in many aspects, do differ with respect to help seeking intentions and attitudinal factors but they differ also with respect to their respective suicide rates. Stigma and shame do not only inhibit help seeking for psychological problems with the risk that these problems aggravate and thus increasing the risk of suicidal behavior [3]. In itself, stigma and shame create distress which people, who already have psychological problems, must overcome. Therefore stigma is not only an important barrier for help seeking but it is also a risk factor for suicide [19;20].

Although it is often assumed that the taboo regarding psychological help seeking is diminishing in recent years, our results indicate that still a considerable part of the people have negative attitudes and experience stigma related to psychological help seeking. Given the evidence of the inhibiting effect on professional and informal help seeking and thus on the prevention of psychological problems and suicide, sensitizing campaigns within the general population remain necessary [43]. As pointed out before, these attitudinal factors are in part culturally determined and they can vary regionally between but also within countries [21-23]. Further research should investigate the relation between these attitudinal factors, help seeking and regional suicide rates. Insight in these regional determinants is of interest for the development of mental health and suicide prevention policies.

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6. Paper 6

Stigma, attitudes and intentions related to help-seeking for psychological problems associated with regional suicide rates

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In this ecological study we investigate if help seeking related stigma, attitudes and intentions and attitudes toward suicide are associated with the suicide rates of 20 regions within the Netherlands and Belgium.
Significant associations were found between regional suicide rates and the intention to seek informal help (Beta = -1.47, p = .001), self-stigma (Beta = 1.33, p = .038) and shame (Beta = 0.71, p = .030). The association between self-stigma and suicide rate was mediated by intentions to seek informal help. These results suggest that, in order to promote suicide prevention at the level of the regional population, stigma, shame and intentions to seek help should be targeted in the public domain.

INTRODUCTION

Suicide rates can differ between countries and even between regions within a country (Korosec Jagodic, Agius, & Pregelj, 2012). Although not always unequivocal, predictors of the geographical variation in suicide rates were among others: socio-economic integration (e.g.(Rehkopf & Buka, 2006)), religion (e.g.(van Tubergen, te Grotenhuis, & Ultee, 2005)), psychological well-being (Bray & Gunnell, 2006), mental health care availability (Pirkola, Sund, Sailas, & Wahlbeck, 2009), availability of suicide means (Miller, Barber, White, & Azrael, 2012), genetic predisposition (Voracek & Marusic, 2008) and cultural values (Webster Rudmin, Ferrada-Noli, & Skolbekken, 2003). Researchers have pointed out that also intentions, attitudes and stigma could contribute to our understanding of differences between regional suicide rates (Judd, Cooper, Fraser, & Davis, 2006; Stark, Riordan, & O'Connor, 2011). There are different ways in which intentions and attitudinal factors are related to suicide.

First, negative attitudes, shame and stigma in relation to help-seeking impose major barriers to seek psychological help (Reynders, Kerkhof, Molenberghs, & Van Audenhove, 2014). According to the Theory of Planned Behavior, behavioral attitudes and normative beliefs (e.g. expecting stigmatizing reactions), determine the readiness to exhibit a certain behavior (e.g. help-seeking). This readiness or intention is considered to be a direct antecedent of behavior (Aizen, Brown, & Carvajal, 2004). Receiving psychological help is a assumed to be an

important protective factor of suicide because it decreases the risk for psychological problems to aggravate further into severe life crises (Deisenhammer, Huber, Kemmler, Weiss, & Hinterhuber, 2007).

Second, besides this indirect relation via help-seeking, there is also a more direct relation between stigma and suicide. According to the stress - diatheses model, most suicidal persons are characterized by a certain level of biological, psychological and social vulnerability (Van Heeringen, 2012). When confronted with additional stressors, the more vulnerable persons can enter a situation of hopelessness and helplessness in which suicide seems to be the only way to end the psychological suffering. People who suffer from stigmatizing attitudes and shame must not only cope with their psychological problems but they also must undergo the negative consequences of stigma, such as discrimination, reduced self-esteem and reduced self-efficacy (Rüsch et al., 2009). Based on the stress - diatheses model we could state that psychological problems are part of the diatheses while the consequences of stigma and shame generate the additional stress.

Third, in addition to stigmatizing attitudes, other attitudes toward suicide may influence suicidal behavior. Compared to people without a suicidal past, people with a suicidal past have more often positive attitudes toward suicide (Arnautovska & Grad, 2010; Joe, Romer, & Jamieson, 2007). Furthermore, among men with depressive symptoms, men with accepting attitudes toward suicide were more likely to attempt suicide than those without accepting attitudes (Gibb, Andover, & Beach, 2006).

The attitudes and stigma discussed above are not merely individual traits. Attitudes and stigma are internalized by individuals through the cultural belief systems of the social entity to which they belong (Link & Phelan, 2001). For example, cross-national studies found an association between population levels of stigma and individual stigma and help-seeking intentions (Evans-Lacko, Brohan, Mojtabai, & Thornicroft, 2012; Mojtabai, 2010). Hence, attitudes and stigma differ between countries and even between regions within a country.

Therefore, we assume that intentions, attitudes and stigma related to help-seeking for psychological problems and attitudes toward suicide could be determinants of interregional variations of suicide rates. Nevertheless, these topics have received little attention in cross-national and cross-regional research. Two studies found that compared to people living in nations with lower suicide rates, people living in nations with higher suicide rates, had more often approving attitudes toward suicide (Cutright & Fernquist, 2004; Stack & Kposowa, 2008). This association was not confirmed in a comparative analysis of Russia, Sweden and Norway (Renberg, Hjelmeland, & Kopsov, 2008) Furthermore, nations characterized by higher suicide rates had also lower levels of accepting attitudes toward people with a mental health problem (Schomerus et al., 2014). Another study found that people living in Flanders, the region with the higher suicide rates, experienced more attitudinal barriers against help-seeking than people living in the low suicide rate country, the Netherlands (Reynders et al., 2014). This study builds further on the findings of the previous studies by examining additional forms of attitudes and stigma related to help seeking and by taking into account help-seeking intentions. Furthermore, this study adds by investigating these associations at the level of regions within a country. This would be of interest because countries are not homogenous entities and both suicide rates as well as attitudinal factors can vary within a country. The aim of this study is to investigate the

association between on the one hand attitudes toward suicide, help-seeking related intentions, attitudes, self-stigma, shame, perceived stigma and on the other hand, regional suicide rates.

METHODS

Study Sample

The target population for this study is the general population of the Flemish Community of Belgium and the Netherlands. In contrast to the French speaking community of Belgium, the Flemish Community and the Netherlands are relatively similar on many dimensions. For example, besides the common Dutch language, Flanders and the Netherlands have comparable fertility rates (respectively 1.75 and 1.72), levels of education (25.3 and 25.2), populations densities (478.2 and 496.9/km²), employment rates (4.5% and 5.3%) and percentages of people at risk of poverty (15.0 and 15.7(Eurostat, 2014). Nevertheless, Flanders has a suicide rate (15.4/100.000 inhabitants) which is 80% higher than that of the Netherlands (8.8/100.000 inhabitants). Furthermore, there is evidence that Flanders and the Netherlands do differ with respect to cultural factors such as Hofstede's cultural values 'uncertainty avoidance' and 'masculinity' (Claes & Gerritsen, 2011) These characteristics make them well suited to investigate the association between attitudinal factors and suicide rates. Thus, although data are available on French speaking Belgium as well, we have chosen to compare two Dutch speaking geographical entities.

For the selection of the sample units, we used a combination of a cluster sample and a systematic sample. The multi–stage cluster sample implies that we started at the provincial level, out of each province we selected the regions. In the Netherlands, these were so called 'COROP-regions' and in Flanders 'care regions'. These regions are defined by the authorities with the purpose of conducting long term cross-regional research (the Netherlands) or evaluating and adjusting health policy (Flanders). Out of these regions we further selected municipalities and out of the municipalities, we finally selected the individual respondents. For the selection of the units at each stage we used a systematic sampling technique. The result is a random, geographically well-spread and representative sample. The Dutch sample contains 4550 individuals out of 38 municipalities, out 8 of COROP regions. In Flanders the outcome of this procedure was 4550 individuals, out of 52 municipalities, out of 12 care regions. The systematic sample of individuals was selected out of the official population register by the authorities.

Procedure

The procedure for both countries was identical. The selected individuals received a structured postal questionnaire together with a guided letter. The letter informed the participants about the goal of the research, the voluntariness of participation and the anonymity of the study. Besides this, a telephone number and website of a free and anonymous crisis line was mentioned. Non-respondents received reminders after two weeks and after five weeks. This research procedure was evaluated by the Belgian Privacy Commission and the Dutch Ethical Commission and the Dutch Ethical – Medical Assessing Commission for Mental Health. The response rate was 27.4 % for the Dutch population and 41.4% for the Flemish population.

Dependent variables

Because suicide rates of relatively small regions can vary considerably, we calculated mean standardized suicide rates per 100.000 inhabitants for the period 2005-2010. Data were collected from the Flemish Agency for Care and Health and the Dutch Central Bureau for Statistics.

Control variables

Demographic factors: Data about gender, age and place of residence were collected. Furthermore, respondents were asked if they were employed and what their level of education was. For each region, the percentage of people with college or university degree was calculated.

Mental health This was measured by the five item Mental Health Summary Scale (MH) from the 36-Item Short-Form Health Survey (SF-36) (Ware, Kosinski, & Keller, 1994). Scores range from 0 to 100. High scores indicate better mental health (Ware et al., 1994). Reliability and validity are well established. Reliability for MH scores usually exceed 0.90 (Ware et al., 1994). The five items were as follows: how much of the time during the past 4 weeks have you been a very nervous person?; Have you felt so down in the dumps that nothing could cheer you up?; Have you felt calm and peaceful?; Have you felt downhearted and blue?; Have you been a happy person? The six response choices were: all of the time, most of the time, a good bit of the time, some of the time, a little of the time, none of the time.

For each region the average scores were calculated.

Seriously suicidal thoughts. Respondents were asked yes or no if they ever had made a plan to commit suicide. For each region the percentage of people who responded yes was calculated.

History of professional help seeking. Respondents were asked yes or no if they had ever received help for psychological problems from a psychotherapist or a psychiatrist. For each region the percentage of people who responded yes was calculated.

Explanatory variables

Intention to seek professional help. Respondents were asked if they would seek professional help from a psychiatrist or a psychotherapist if they would have psychological problems. For each region the percentage of people who responded yes was calculated.

Intention to seek informal help. Respondents were asked if they were inclined to seek informal help from family or friends if they would have psychological problems. For each region the percentage of people who responded yes was calculated.

Attitudes toward help seeking was measured by the Attitudes toward Seeking Professional Psychological Help scale (Short form) which was developed to measure mental health treatment attitudes. This widely used scale was designed as a one-dimensional 10 item scale (Fischer & Farina, 1995). Test –retest reliability (.80), and internal consistency (.84) were good. Validity was proved to be good through a negative relation with stigma and positive relations with emotional disclosure and intention to seek help (Elhai, Schweinle, & Anderson, 2008). Scores were standardized on a scale from 0 to 100. Higher scores indicate more positive attitudes. For each region the average scores were calculated.

Self-stigma was measured by the Self-Stigma of Seeking Help –Scale (SSOSH). The scale has a uni-dimensional factor structure and consists of 10 items such as “Seeking psychological help would make me feel less intelligent” (Vogel, Wade, & Haake, 2006). The internal

consistency of the scale ranged between .86 to .90 (Vogel, Wade, & Hackler, 2007). Correlation with the intention to seek counseling and attitudes toward help seeking proves its construct validity (Vogel et al., 2006). For each region the average scores were calculated on a scale from 0 to 100. Higher scores indicate more self-stigma.

Shame for seeking help. We developed three six – point Likert items. The items were: 'I would prefer that my neighbors did not know if I would receive help for psychological problems', 'I would be ashamed if I needed help for psychological problems' and 'I would keep it to myself if I would receive help for psychological problems'. The internal consistency of the three items was .80. Previous analysis showed good construct validity with Attitudes toward Seeking Professional Psychological Help- scale (Short form) and discriminant validity with Self-Stigma of Seeking Help –Scale (Reynders et al., 2014). Scores went from 0 to 100. For each region the average scores were calculated. Higher scores indicate more shame for help-seeking.

Perceived stigma was measured by the Perceived Devaluation- Discrimination scale (Link, Cullen, Frank, & Wozniak, 1987). The scale was developed as a one-dimensional scale containing 12 items such as "Most people feel that entering a mental hospital is a sign of personal failure". The average internal consistency is .78 and the scale shows good construct validity through a relationship with internal experience of demoralization and lower self-esteem (Link, Struening, Neese-Todd, Asmussen, & Phelan, 2001). Scores went from 0 to 100. For each region the average scores were calculated with higher scores indicating more perceived stigma

Accepting attitudes toward suicide was measured by three items on a six – point Likert scale developed for this study. The three items were: "There are situations in which suicide is the only way out"; "If I suffer from a severe and incurable disease, I would consider suicide"; "Everybody has the right to commit suicide". Cronbach's alpha for these three items were .655 for the Dutch population and .638 for the Belgian population. Although rather low, an alpha value of $\geq .60$ for new scales and scales with few items is acceptable (Nunnally, 1988).

Disapproving attitudes toward suicide was developed using three items on a six - point Likert scale. These items were: "Suicide means that one is walking away from his daily responsibilities"; "People who consider suicide, would feel better if they would not let themselves go and show some strength instead"; "Suicide is a cowardly act". The internal consistency for the Dutch population was .724 and .738 for the Belgium population. The scores of both suicide attitude scales went from 0 to 100.

Analysis

For each of the 20 regions, percentages for binary variables and average scores for continuous variables were calculated. Mean regional scores and standard errors for each variable included in the analysis are presented for the Netherlands and Flanders. One - way ANOVA was used to determine the level of significance between the differences of the Dutch and the Flemish regions (Table 1). Table 2 presents the correlation coefficients and p-values between the regional suicide rates on the one hand and the control and explanatory variables on the other hand. Next, multiple linear regression analysis was conducted with the suicide rates of the 20 regions as dependent variable (Table 3). The model includes all the control variables. Because the intention and attitudinal variables correlate, their effect would be neutralized if we

include them jointly in the regression analysis. Therefore, each of the explanatory variables was separately included in this model. The regression coefficient, standard error and level of significance are presented. The analysis was conducted with SPSS 20.0.

RESULTS

Table 1 One-way ANOVA analysis of regional mean scores and standard errors of the dependent, control and explanatory variables for the 8 regions (1247 respondents) in the Netherlands 12 regions (1884 respondents) in Flanders.

	The Netherlands (8 regions)		Belgium (Flanders) (12 regions)		ANOVA	
	Mean of the Dutch regions	s.e.	Mean of the Flemish regions	s.e.	F	p-value
Dependent variable						
Suicide rate	9.21	0.66	16.64	1.05	27.69	**<.001**
Control variables						
Gender (% men)	49.76	0.91	50.30	1.52	0.73	.791
Average age	42.52	0.48	41.84	0.30	1.66	.215
Percentage higher education	39.92	2.82	38.41	2.26	0.18	.678
Percentage Unemployed	3.0	0.75	3.3	1.57	0.32	.577
Mental health score (SF-36)	74.88	0.45	71.48	0.59	17.28	**.001**
Suicide plan (%)	12.34	1.72	13.58	0.95	0.46	.505
Had received professional help (%)	49.32	1.19	38.98	0.78	27.04	**<.001**
Explanatory variables						
Intent to seek professional help (%)	63.44	1.72	58.36	2.57	23.81	**<.001**
Intent to seek informal help (%)	70.08	0.66	67.07	0.67	9.83	**.006**
Positive attitudes toward help-seeking (average score)	61.27	0.37	57.25	0.49	35.90	**<.001**
Perceived stigma (average score)	54.84	0.40	55.22	0.27	0.68	.420
Self-stigma (average score)	37.11	0.42	41.84	1.67	47.88	**<.001**
Shame (average score)	49.57	0.83	56.46	0.90	28.23	**<.001**
Accepting suicide attitudes (average score)	48.59	3.77	45.60	2.23	4.98	**.039**
Disapproving suicide attitudes (average score)	34.85	2.00	40.71	2.02	40.36	**<.001**

Table 2 Partial correlations with suicide rates (20 regions) adjusted for country the Netherlands / Flanders

	Corr.	p-value
Control variables [a]		
Gender (% men)	-0.06	.818
Average age	-0.22	.368
Percentage higher education	0.08	.738
Percentage unemployed	0.09	.725
Mental health (average score)	0.17	.483
Suicide plan (%)	-0.27	.263
Had received professional help (%)	-0.15	.548
Explanatory variables[b]		
Intent to seek professional help (%)	-0.37	.115
Intent to seek informal help (%)	-.039	.097
Positive attitudes help-seeking (average score)	-0.43	.068
Perceived stigma (average score)	-0.07	.770
Self-stigma (average score)	0.54	**.017**
Shame (average score)	0.56	**.013**
Accepting suicide attitudes (average score)	-0.20	.952
Disapproving suicide attitudes (average score)	-0.32	.180

[a]All control variables were included in the analysis

[b]All explanatory variables were adjusted for all control variables

Table 3 Linear regression analysis with regional suicide rates as dependent variable (20 regions)

	Beta	s.e.	p-value	Beta	s.e.	p-value
Control variables [a]						
Constant	15.69	75.26	.839			
Gender (% men)	0.08	0.30	.855			
Average age	-0.55	0.85	.535			
Percentage higher education	-0.03	0.14	.830			
Unemployed (%)	0.13	0.86	.149			
Country (Flanders reference)	-6.8	4.02	.117			
Mental health (average score)	0.28	0.76	.719			
Suicide plan (%)	-0.15	0.25	.535			
Had received professional help (%)	-0.09	0.32	.774			
Explanatory variables[b]						
Intent to seek professional help (%)				-0.80	0.42	.084
Intent to seek informal help (%)				-1.47	0.53	**.001**
Positive attitudes help-seeking (average score)				-1.34	0.69	.083
Perceived stigma (average score)				0.21	1.18	.861
Self-stigma (average score)				1.33	0.56	**.038**
Shame (average score)				0.71	0.28	**.030**
Accepting suicide attitudes (average score)				-0.13	0.34	.715
Disapproving suicide attitudes (average score)				0.58	0.54	.317

[a]All control variables were included in the analysis

[b]All explanatory variables were adjusted for all control variables

Table 1 shows that the average regional suicide rate was higher in Flanders than in the Netherlands. A one-way ANOVA test indicates that this difference was significant, $F(1, 18) = 27.69$, $p = .000$. Socio – demographic variables did not differ significantly between the Flemish and the Dutch regions. Compared to the Flemish regions, the Dutch regions had better mental health scores. On average, people living in Dutch regions had more often received professional help for psychological problems than their Flemish counterparts. Furthermore, Dutch people were significantly more often inclined to seek professional and informal help, had more positive attitudes and experienced less self – stigma and shame for seeking help for psychological problems compared to Flemish people.

After adjusting for region (the Netherlands / Flanders), self-stigma and shame for help-seeking were significantly and positively associated with the suicide rates of the Dutch and Flemish regions (Table 2).

Table 3 indicates that no significant association was found between the control variables and regional suicide rates. The proportion of variance in regional suicide rates explained by all control variables together was $R^2 = .66$. After adjusting for the control variables, intent to seek informal help was negatively associated with suicide rates. The association between intent to seek formal help, positive attitudes toward help seeking and perceived stigma were not significantly associated with regional suicide rates. Regions with higher scores on self-stigma and shame were positively associated with regional suicide rates after adjusting for all the control variables. When including the control variables and informal help-seeking into the analysis, shame remained significant (Beta = 0.41, p = .025), but self-stigma was no longer significant (Beta = 0.30, p = .227) (data not presented).

DISCUSSION

The aim of this study was to investigate the association between on the one hand regional suicide rates and on the other hand levels of help seeking intentions, help seeking attitudes, stigma and shame within the general population of different regions in the Netherlands and Flanders. These associations were adjusted for control variables which may influence suicide and help-seeking. The socio-economic control variables showed no significant association with regional suicide rates. No difference was found between Dutch and Flemish regions with respect to the percentage of people who had a suicide plan. Although a suicide plan can be considered an antecedent of suicide, our results are in line with findings of other studies which found no clear epidemiological transition from suicidal ideation to suicide. (Bernal et al., 2007; Bertolote, Fleischmann, De Leo, & Bolhari, 2005; Casey et al., 2008). Furthermore, compared to their Flemish counterparts, Dutch people had a slightly better mental health score and they had received more often psychological help. Nevertheless, these variables were not associated with the regional suicide rates. These findings suggest that the pathway between psychological problems to suicidal ideation and suicide is possibly mediated by help-seeking intentions and related attitudinal factors.

The results of our study indicate that higher levels of self-stigma and shame were associated with higher regional suicide rates. In addition, we found a negative association between the intentions to seek informal help and regional suicide rates after controlling for self-stigma and shame. Self-stigma was no longer significant. This suggests that the association between self-

stigma and suicide rates was mediated by informal help-seeking. This supports the assumption that internalizing negative stereotypes about psychological help-seeking is an indirect predictor of suicide rates. However, shame remained positively and significantly associated with the regional suicide rates, supporting the direct effect of shame as a stressor increasing the risk of suicide.

Our results show that the willingness to seek support from family and friends was the strongest predictor of regional suicide rates. Possibly, stronger intentions to seek informal help do not only indicate that people living in regions with lower suicide rates experience less stigma and shame but also that social networks in these regions are characterized by lower levels stigmatizing attitudes, hereby making emotional and social support better accessible.

The assumption that the regional level of intentions to seek professional help is negatively associated with regional suicide rates was not confirmed by our results. Although negative, the association did not reach significance ($p = .084$) possibly due to the relative low number of regions ($n = 20$) included in the analysis. Furthermore, through the aggregation of stigma and other attitudinal indices by region the variability in these types of measures, which are typically seen across individuals, are not captured. In other words, there is likely to be considerable variation in stigma between individuals which may account for a greater proportion of variability in suicidality. Nevertheless, despite the lack of a significant association on a regional level, our results show that in Flanders compared to the Netherlands, the intention to seek professional help was significantly lower and attitudes toward professional help seeking significantly less positive. Less positive attitudes toward help-seeking together with higher levels of shame and stigma do not only determine help-seeking intentions. They also have an influence on provider choice and treatment preference (Van Voorhees, Cooper, & Rost, 2003), treatment adherence (Gabriel & Violato, 2010; Mitchell & Selmes, 2007) and treatment delay (Henderson, Evans-Lacko, & Thornicroft, 2013). This means that these attitudinal factors could jeopardize the quality and effectiveness of the received treatment. Higher levels of stigma and shame could therefore result in higher levels of inadequate help for psychological problems in Flanders compared to the Netherlands. Although the organization of the mental health care plays a prominent role too, it was found that the rate of minimal adequate care and the number of follow-up consultations was higher in the Netherlands than in Belgium (Wang, Aguilar-Gaxiola, Alonso, & Angermeyer, 2007).

Finally, the present study shows that the Flemish regions on average have less accepting and more disapproving attitudes than the Dutch regions. Possibly, these slightly more negative attitudes form an additional barrier for Flemish people with suicidal thoughts to seek help, making them even more at risk of suicidal behavior. This is in line with other research findings that more stigmatizing attitudes toward suicide are associated with less positive attitudes toward help seeking (Calear, Batterham, & Christensen, 2014).

Limitations

Some limitations should be kept in mind in the interpretation of this study. First, the overall response rate is 34.4%. . A review study of academic studies using mail surveys found that the mean response rate was 55.6%, with a standard deviation of 19.7 (Baruch, 1999). The moderate response rate could be explained by the sensitive research subject and by the use of a postal

questionnaire. On the other hand, an advantage of a postal survey is that it is less intrusive than for example a face–to-face interview, making respondents more willing to disclose sensitive information (Ravens-Sieberer, Erhart, Wetzel, Kru¨gel, & Brambosch, 2008). This is particularly important for a study with a sensitive topic such as suicide and help seeking for psychological problems. We also observed a discrepancy in response rates between the Netherlands (27.4%) and Flanders (41.4%). This could be due to self-selection, biasing true differences between the populations. Further, explanations for these differences are speculative. Possibly, Dutch people are less willing to participate in scientific research. The difference in response rate could also indicate a stronger abstention among the Dutch population to disclose sensitive information. This however is in contrast to our finding that Dutch respondents experienced less stigma than their Flemish counterparts. Furthermore, based on our demographic data (gender, age, level of education and unemployment) we cannot conclude that both respondent groups differ significantly. In addition, our data show only minor deviations from other official statistics suggesting that our data have an acceptable level of representativeness. For example, the average age in the Netherlands and Flanders is around 39 years old. In our data the average age was 41.8 (Flanders) and 42.5 (the Netherlands). According to Eurostat, the percentage unemployed (age 25-64) in the Netherlands is 5.3% and in Flanders 4.5%. In our data these percentage were 3.1 and 3.7 (age 18-64). The percentage of people (age 25-64) with tertiary education attainment is in the Netherlands 32% and in Flanders 35% (Eurostat). In our data (age 18-64) the percentages were respectively 40 and 41. Second, the independent and dependent aggregated variables and the cross-sectional study design does not allow us to draw conclusions on causal relations between the variables nor to draw conclusions on individual level suicidal behavior. Therefore, future individual-level and longitudinal analysis is needed to investigated the association between our attitudinal factors and suicidal behavior. Third, only intentions to seek help were measured and not actual help-seeking behavior. Although intentions are assumed to be direct antecedents of behavior, discrepancies between intentions and behavior were observed (Ajzen, Brown, & Carvajal, 2004). Fourth, our attitudinal variables and measures of stigma are related to general psychological help-seeking instead of help-seeking specifically for suicidal problems. Moreover, previous research has demonstrated that stigma towards a specific mental health problem (e.g. suicidality) may be a stronger predictor of help seeking than stigma towards help seeking or fear of discrimination (Schomerus et al., 2009). Fifth, because attitudinal factors and suicide rates differ between genders, it would be of interest to disaggregate our data by gender. However, this would lead to a low number of participants in some regions undermining the representativeness of our data.

CONCLUSIONS

Keeping these limitations in mind, we can conclude that intentions to seek informal help were lower and levels of self-stigma and shame were higher in regions with higher suicide rates within the Netherlands and Flanders. Why these attitudinal factors vary regionally within a country and how these factors are associated with suicide rates remain unclear. Therefore, more research is needed to understand the interrelationship between the organization and quality of mental health care, the regional variations in stigma, shame, attitudes and intentions to seek help, and suicide rates. In addition, it would be interesting to investigate the association between

broader cultural values and regional suicide rates. Nevertheless we believe that from a suicide prevention point of view our results are promising. In contrast to many other macro level suicide risk factors, such as socio-economic factors, these attitudinal factors can be targeted and adjusted within the framework of suicide prevention policies by means of awareness campaigns and measures to increase the accessibility and acceptability of mental health care services.. Furthermore, suicide prevention programs should be attentive to regional differences.

Declaration of interest

None

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General conclusions and recommendations

The aim of this thesis is to contribute to our understanding of the differences between regional suicide rates. In this final section, we wil first answer the research questions by summarizing the main results. In the second paragraph, we will discuss the main limitations of our studies. In the third paragraph we will elaborate on our results with a special focus on the Flemish and the Dutch context. Fourth, based on our findings we will formulate policy recommendations and fifth, we will make suggestions for future research.

Research questions 1 (Study 1 - literature study): What are explanations for differences in suicide rates?

Research question 2 (Study 2 - paper 1): Are the official European suicide rates reliable?

Research question 3 (Study 3 - paper 2): Are human values and socio-economic factors associated with regional suicides?

Research question 4 (Study 4 - paper 3 - 6)**:** Are intentions, attitudes and stigma with respect to help-seeking and attitudes toward suicide associated with regional suicide rates?

> *Subquestion 2.1* (paper 3): What are the differences between people with a suicidal past and people without a suicidal past with regard to psychological problems, self-stigma, perceived stigma, attitudes toward help-seeking, intentions to seek informal en professional help and attitudes toward suicide?
>
> *Subquestion 2.2* (paper 3 -5)**:** What are the differences between Flanders and the Netherlands concerning psychological problems, suicidal ideation and behavior, self-stigmatization, shame, perceived stigma, attitudes toward help-seeking, intentions to seek informal and professional help, knowledge about health care, satisfaction of care and attitudes toward suicide?
>
> *Subquestion 2.3* (paper 5)**:** What are the associations between on the one hand self-stigmatization, shame, perceived stigma, attitudes toward help-seeking and on the other hand intentions to seek informal and professional help for psychological problems?
>
> *Subquestion 2.4* (paper 6)**:** What are the associations between on the one hand self-stigmatization, shame, perceived stigma, attitudes, intentions concerning help-seeking and on the other hand regional suicide rates in Flanders and the Netherlands?

1. Main results

Research questions 1 (Study 1 - literature study): What are explanations for differences in suicide rates?

First of all, there is a general agreement that the official statistics underestimate the actual number of suicides, but also that the degree of underestimation differs between countries. For this reason caution is needed when using, interpreting and comparing cross-regional suicide statistics.

Keeping this general conclusion in mind, our review of the literature strongly suggests that many factors have been found to be associated with regional suicide rates. The most investigated factors were related to socio-economic integration. The majority of studies on this topic found a positive association between suicide rates and levels of deprivation, unemployment, lower levels of educational attainment. Indicators of social fragmentation such as higher divorce rate, lower fertility rate, higher proportion of elderly and lower levels of social capital, were found to be a predictor of higher suicide rates. The association between religious integration and suicide rates was not unequivocal. It was argued that especially in more secularized regions, religion will become less important in explaining suicide rates.

As an antecedent of suicide on an individual level, suicidal thoughts and suicide attempts were not found to be reliable predictors of national suicide rates. The assumption that habitants of regions with higher suicide rates more often had positive attitudes toward suicide, was only confirmed by one study. Another risk factor of suicide on an individual level are psychological problems. On a macro-level however, evidence for an association between prevalence of psychological problems and suicide was weak, with the exception of alcohol abuse. The availability of mental health service providers and suicide rates was also found to be unclear, although different studies showed that a higher number of antidepressant prescriptions, especially for SSRI's, was associated with lower suicide rates. Furthermore, based on the literature, we cannot conclude that the implementation of national mental health policies translated itself in lowered suicide rates. There was limited support for the effectiveness of alcohol prevention and suicide prevention policies.

Furthermore, preliminary evidence was found for the Finno-Ugrain hypothesis, suggesting a genetic vulnerability for suicide of certain ethnic groups. Cross-national studies conducted research on the role of culture on suicide rates. But the evidence is weak and the results were inconclusive.

Finally, based on the substantial body of research concerning the rural-urban dichotomy, it was argued that higher rural suicide rates could be explained by a combination of most of the above discussed risk and protective factors. An additional merit of this line of research was

the attention given to the role of cultural values, attitudes and stigma in relation to suicide rates.

Research question 2 (Study 2 - paper 1): Are the official European suicide rates reliable?

In Paper 1 we investigated the reliability of suicide rates in Europe. We did this by comparing two largely independent sources of railway suicides statistics in 15 European countries. We concluded that the official suicide rates were an underestimation of the actual number of suicides and that this underestimation differed between countries. This suggests that caution is advised when comparing and analyzing national suicide rates. The strongest accordance between these two sources of suicide rates was found in Flanders and the Netherlands.

Research question 3 (Study 3 - paper 2): Are Human values and socio-economic factors associated with regional suicides?

By means of a multilevel and longitudinal analysis we investigated the extent to what human values predict regional suicide rates, after controlling for indicators of social integration in 107 regions of 11 European countries. Unemployment rate, social capital and social contact were not associated with regional suicide rates. 'Autonomomy vs embeddedness' was the most consistent predictor of suicide rates. In regions where Autonomy values were strongly appreciated, suicide rates were lower compared to regions were Embeddedness was found to be an important value.

Research question 4 (Study 4 - paper 3 - 6)**:** Are intentions, attitudes and stigma with respect to help-seeking and attitudes toward suicide associated with regional suicide rates?

Subquestion 4.1 (paper 3): What are the differences between people with a suicidal past and people without a suicidal past with regard to psychological problems, self-stigma, perceived stigma, attitudes toward help-seeking, intentions to seek informal en professional help and attitudes toward suicide?

Paper 3 investigated if there is a difference between persons with and without a suicidal past concerning socio-demographic factors, mental well-being, received help, intentions to seek help, stigma and attitudes in relation to help-seeking and attitudes toward suicide. From these results, it was apparent that, compared to Dutch women, significantly more Flemish women ever had a suicidal past. All other indicators of a suicidal past did not differ between Flemish and Dutch people. Compared to people without a suicidal past, people with a suicidal past seem to have a reduced mental health, but they also more often received professional help for psychological problems. In spite of this, people with a suicidal past are less often inclined to seek professional nor informal help in the future and they often have a passive coping style. Furthermore, people with a suicidal past more often perceive stigma and experience more

self-stigma (men) and shame (women). In general, we see that people with a suicidal history have more tolerant attitudes toward suicide.

Subquestion 4.2 (paper 3- 5)**:** What are the differences between Flanders and the Netherlands concerning psychological problems, suicidal ideation and behavior, self-stigmatization, shame, perceived stigma, attitudes toward help-seeking, intentions to seek informal and professional help, knowledge about health care, satisfaction of care and attitudes toward suicide?

A second research question of Paper 3 concerns the differences between Dutch and Flemish people with a suicidal past with regard to the above factors. Compared to Dutch people with a suicidal past, the Flemish were less inclined to seek professional or informal (only men) help for psychological problems, they experienced more shame (only men) and they less often had positive attitudes toward help-seeking.

In a fourth paper, we investigated more in detail the differences between Flanders and the Netherlands concerning received help, intentions to seek help, patient satisfaction and knowledge about health care. In general, we observed that the received help and the intention to seek help are higher in the Netherlands than in Flanders. Among persons who ever have had psychological problems, more Dutch people seemed to have consulted a psychologist/psychotherapist and they more often had received a more long-lasting treatment. More Dutch than Flemish men had ever received help from a general practitioner. Furthermore, more Dutch people seemed to have the intention to seek psychological help from a psychiatrist and a psychologist/psychotherapist compared to Flemish people. Moreover, more Dutch men had the intention to use psychotropic drugs and more Dutch women had the intention to seek support from family members than respectively Flemish men and women. Flemish women however, more often had the intention to contact a crisis help line than Dutch women. Paper 5 shows that, after controlling for socio-demographic factors, mental health care and previously received help, people in the Netherlands significantly more often had the intention to seek help from a general practitioner, a psychiatrist or a psychologist/psychotherapist, to undergo a medical treatment and to seek help from family compared to Flemish people. Out of Paper 4 we conclude that health care organizations were better known in the Netherlands than in Flanders. Dutch men were more satisfied with the help from a psychotherapist and the help from a general practitioner. Both associations were near significant for women. Globally, Dutch people had more tolerant attitudes toward suicide.

*Subquestion 4.3***:** What are the associations between on the one hand self-stigmatization, shame, perceived stigma, attitudes toward help-seeking and on the other hand intentions to seek informal and professional help for psychological problems? (paper 5)

In Paper 5 we investigated the differences between Flanders and the Netherlands concerning attitudes and stigma in relation to help-seeking and the association between these attitudes and help-seeking intentions. After controlling for socio-demographic factors, we conclude that people in the Netherlands more often have positive attitudes toward help-seeking and that they experience less self-stigmatization and shame if they would seek help for psychological problems. A weaker mental health was associated with more self-stigmatization, shame and perceived stigma. A history of received professional help for psychological problems was associated with more positive attitudes toward help-seeking, less stigma and less shame. Positive attitudes toward help-seeking were positively associated with the intention to seek professional help and informal help with family, and with the use of psychotropic drugs and negatively associated with a passive coping style, both in Flanders as well as in the Netherlands. With regard to self-stigmatization and shame we observed associations that were opposite to these of positive attitudes toward help-seeking. In Flanders however, shame seems to be associated with a stronger intention to use psychotropic drug.

Subquestion 4.4: What are the associations between on the one hand self-stigmatization, shame, perceived stigma, attitudes, intentions concerning help-seeking and on the other hand regional suicide rates in Flanders and the Netherlands? (paper 6)

In Paper 6 we researched if there was an association between regional suicide rates in Flanders and the Netherlands and help-seeking, mental health, suicidal past, attitudes and stigma. Mental health, suicidal past and previous professional help were no significant predictors of regional suicide rates. The intention to seek informal help was negatively associated with regional suicide rates. Self-stigmatization and shame to seek help were positively associated with regional suicide rates.

2. Limitations

Some limitations must be kept in mind when interpreting our findings. Most of the studies included in the literature review had a cross- sectional research design. Therefore, it is not possible to draw strong conclusions about the causality of the associations.

With respect to Study 2, the most important limitations are that the results concern railway suicides only and therefore, they cannot be extrapolated to all types of suicides. Second, national suicide statistics and ERA data are not perfectly comparable, due to different categorisations of the causes of death. Third, it is difficult to determine whether ERA data are equally or more reliable than national data and whether they under- or overestimate the actual number of suicides.

In Study 3, the analysis was limited to countries and variables for which data were available. Furthermore, in a diversifying Europe, the idea of nations or regions as homogenous cultural entities is open to criticism.

When interpreting the results of Study 4, following limitations should be considered. First, it should be noted that the aggregated variables and the cross-sectional study design do not allow us to draw conclusions on causal relations between the variables, nor to draw conclusions on individual level suicidal behavior. Second, the response rate is rather low. This can be explained both by the strong emotional connotation of the research subject, as well as by the use of a postal questionnaire for collecting data. Despite of the reminders and incentives, subjects are less compelled and encouraged to participate when contacted by mail than in the case of face-to-face contact. On the other hand, a postal survey creates more security and anonymity, making participants less restrained to answer more sincere. Third, we also observed a discrepancy in response rates between the Netherlands (27.4%) and Flanders (41.4%). Explanations for these differences are speculative. Possibly, Dutch people are less willing to participate in scientific research. The difference in response rate could also indicate a stronger abstention among the Dutch population to disclose sensitive information. This however, is in contrast to our finding that Dutch respondents experience less stigma than their Flemish counterparts. Furthermore, based on our demographic data (gender, age, level of education and unemployment), we cannot conclude that both respondent groups differ significantly. In addition, our data show only minor deviations from other official statistics, suggesting that our data have an acceptable level of representativeness. Fourth, the research sample includes only participants between 18 and 65 years old. Therefore, our results cannot be generalized for teenagers and the elderly. Fifth, although our literature review found some evidence of an association between the prevalence of alcohol abuse and suicide rates, we did not assess alcohol use.

3. General discussion

The differences in reliability of suicide rates hinder international comparison, however the estimated degree of underestimation is similar for Flanders and the Netherlands.

The reliability of official suicide statistics is determined by different factors such as cultural, legal, forensic, administrative factors, etc. The reliability of suicide rates is highly important because policies and research are often based on these official suicide rates. Study 1 strongly suggests that the official suicide rates are most likely an underestimation of the actual incidence of suicide, but that in the case of Flanders and the Netherlands this underestimation has the same magnitude. Consequently, we conclude that the difference in official suicide rates between Flanders and the Netherlands reflects a real difference. Therefore, we assume that suicide rates in Flanders and the Netherlands are suitable for reliable comparative

research. Study 1 also indicates that in other European countries such as France, Italy, Latvia and the Czech Republic, official suicide rates are possibly less reliable. This means that caution is needed in cross-national research. One way to moderate the reliability bias of suicide statistics, is to take deaths of which 'the intent is undetermined' into account. This category is the most important concurrent cause of death of suicide in the ICD-10 classification system.

Differences in psychological risk factors of suicide between Flanders and the Netherlands are limited.

Our studies indicate that the prevalence of psychological problems in Flanders and the Netherlands is similar. Furthermore, no significant difference between Flanders and the Netherlands was found with respect to the percentage of people reporting a history of suicide attempts or suicidal ideation. Only the percentage of women that ever had a suicidal wish (Study 2) is higher in Flanders than in the Netherlands. There is no comparative research between Flanders and the Netherlands, but our results largely correspond to the findings of comparative research in Belgium and the Netherlands (Bernal et al., 2007), in which no evidence was found for significant differences with respect to the prevalence of psychological problems. Moreover, we found no association between regional suicide rates and psychological problems or suicidal past (Study 5). This finding does not exclude suicidal past and psychological problems as important risk factors of suicide on the individual level. Nevertheless, we can conclude that besides these risk factors of suicide, there are other factors that play a role in the explanation of the differences between regional suicide rates.

The association between socio-economic variables and regional suicide rates is limited.

The lack of clear associations could possibly be explained by the fact that Flanders and the Netherlands are relatively similar with respect to these socio-economic factors. Furthermore, both regions/countries are characterized by extensive social safety nets which, in case of socio-economic misfortune, could compensate for the negative effects. However, aside of the studies in Flanders and the Netherlands, our European longitudinal study found neither clear evidence for a relation between socio-economic factors and differences in male suicide rates and only limited evidence for female suicide rates. Most studies finding an association between socio-economic factors and regional suicide rates are cross-sectional, which means that they cannot uncover causal relations. Other longitudinal studies finding a relation between socio-economic variables and suicide rates focused on time trends within a country rather than analyzing regional or national differences. In conclusion, socio-economic factors do seem to explain suicide trends of a country, but not necessarily differences between countries or regions.

Compared to Flemish people, Dutch people more often have the intention to seek help and they more often received help for psychological problems.

In general, we can conclude that this observation applies to all forms of psychological help after controlling for socio-demographic factors, mental well-being and previously received help. The difference between Flanders and the Netherlands was also found when only considering people with a suicidal past. The differences between both regions were most clear for specialized help-seeking. In addition, our results show that Dutch people are more often than Flemish people inclined to seek informal help from family and friends, although the latter difference was only near significant.

In line with the differences in intentions to seek help, we also found that people in the Netherlands more often received help for psychological problems than in Flanders. Still there are some remarkable observations. First, people in the Netherlands more often received help from a general practitioner, notwithstanding the fact that in Flanders there is 1 general practitioner per 807 inhabitants (Vlaams Agentschap Zorg & Gezondheid), against 1 per 1891 inhabitants in the Netherlands (Hingstman & Kenens, 2011). This could be explained by the explicit gate keeper function of the general practitioner. Patients in the Netherlands are stimulated by the obligatory basic health care insurance to first consult a general practitioner, who, if deemed necessary, can refer to more specialized care providers.

Second, people in the Netherlands more often received help from a psychologist/psychotherapist than in Flanders. This can also be explained by the explicit gate keeper function of the general practitioner. General practitioners with a gate keeper function seem to be more alert to psychological problems but do not spend more time on psychosocial communication (Verhaak, Bensing, & van der Brink-Muinen, 2007). Moreover, Dutch general practitioners have twice as much patients compared to their Belgian colleagues (Remmen et al., 2013). Furthermore, there are guidelines for a multidisciplinary approach of psychological problems in the Netherlands (Dezetter, Briffault, Bruffaerts et al., 2013). These factors enhance the collaboration between Dutch general practitioners and psychosocial care providers (Kovess-Masfety et al., 2007).

A third observation is that, in contrast to a psychologist/psychotherapist, the proportion of people who received care from a psychiatrist does not differ between Flanders and the Netherlands. In the Netherlands the psychologist/psychotherapist is a recognized profession and psychotherapy is mainly reimbursed by the obligatory basic health care insurance. In Flanders, psychotherapy is reimbursed or for free under stricter conditions. For example, psychotherapy provided by a doctor such as a psychiatrist is reimbursed. That is why in Flanders the financial barrier to consult a psychiatrist instead of a psychologist is lower.

A fourth observation is that, relatively, Flemish people more often consult a general practitioner and a psychiatrist and Dutch people more often consults a psychologist. The percentage of Flemish and Dutch people who had psychological problems and took psychotropic drugs was comparable, even though Flemish people less often received professional help and have a weaker intention to seek help. This is also translated in the health care availability. Flanders counts six times more pharmacists and twice as much general practitioners and psychiatrists per 100.000 inhabitants than the Netherlands.

Fifth, we see that people in the Netherlands not only received more help for psychological problems, but also that this help more often consisted of a long term treatment. While in Flanders, people more often had a single or limited number of consultations. This suggests that people in the Netherlands more often received follow-up consultations, which benefits the quality of health care. This finding corresponds with previous research, which proves that in the Netherlands more often minimal adequate mental health care is provided compared to Belgium (Wang et al., 2007).

More Dutch than Flemish people have a good knowledge of the availability of care providers and they are more often satisfied about the received care.

While the function of a psychiatrist and a psychologist/psychotherapist are equally well known in both regions, we observe that mental health care organizations are remarkably better known in the Netherlands. This is particularly problematic with regard to accessible first line health care. Only crisis help lines are much better known in Flanders than in the Netherlands. This explains why Flemish people are more inclined to consult a crisis help line compared to the Netherlands.

Furthermore, for all types of health care we see that, with the exception of care from a psychiatrist, Dutch people are more often satisfied with the received care compared to Flemish people. Compared to Flemish people, Dutch people also were more often in treatment and had less single consultations. Possibly, this indicates more adequate care and as a result, elevated levels of satisfaction among Dutch patients. The other way round, research showed also that lower patient satisfaction negatively influences the intention to plan follow-up consultations (Freed, Ellen, Irwin, & Millstein, 1998) and treatment adherence (Vermeire, Hearnshaw, Van Royen, & Denekens, 2002), which both determine the quality of care.

More Dutch than Flemish people have positive attitudes toward help-seeking. More Flemish people experience self-stigma and shame in relation to help-seeking compared to Dutch people.

Attitudes and stigma are not strictly individual characteristics, but they are shaped within and by a society (Evans-Lacko et al., 2012). As socio-cultural factors, attitudes and stigma therefore also influence how people cope with psychological problems (Mojtabai, 2010). Our research showed that people who experienced more shame and self-stigmatization, also less often have positive attitudes toward help-seeking. Flemish people experience more shame and self-stigmatization if they would seek psychological help. But no difference was found between Flemish and Dutch people with respect to perceived stigma. Perceived stigma was weakly associated with shame and self-stigma and not at all associated with attitudes toward help-seeking.

There is an association between on the one hand help-seeking related attitudes, self-stigma and shame and on the other hand intentions to seek help.

Positive attitudes toward help-seeking are positively and self-stigmatization and shame are negatively associated with the intention to seek professional help for psychological problems. This association was found in Flanders and the Netherlands. An important difference between both populations is that, compared to Flemish people, Dutch people more often have favorable attitudes, are less self-stigmatizing and experience less shame. This explains why Flemish people are less inclined to seek help. A particular observation concerns the absence of a significant association between self-stigmatization and the intention to use psychotropic drugs. But we did observe a positive association between shame and the intention to use psychotropic drugs, but only in Flanders. This indicates that shame not only is an emotional reaction that has a negative influence on the intention to seek help in general and in particular on the intenion to seek help form a psychotherapist. It also suggets that shame is accompanied by a stronger intention to follow a pharmacological treatment. In this respect, it is remarkable that perceived stigma are not associated with professional help-seeking, except for help-seeking form a psychologist/psychotherapist and only in Flanders. The discriminating consequence of perceived stigmatization is only imminent after being labeled as 'psychologically ill'. Hiding psychological problems is an efficient strategy to avoid labeling. One can hide psychological problems by keeping the received help secret. This is easier with a pharmacological treatment than with psychotherapy. Furthermore, perceived stigma is also negatively associated with the intention to seek help from family, but not with the intention to seek help from friends. This could be explained by the assumption that the fear for discrimination is limited if receiving help is kept secret to the informal network. The informal networks obviously consists to a great extent of family and friends. In the case of friends, one has a choice to select friends that do not have stigmatizing attitudes. In the case of family one

does not have this option. That is why we can assume that perceived stigma is negatively associated with the intention to seek help from family.
Another important observation is that shame, and to a lesser extent, self-stigmatization concerning seeking professional help, is also associated with a weaker intention to seek help from friends and family.

Intentions to seek informal help, self-stigma and shame are associated with regional suicide rates in Flanders and the Netherlands.

The relationship between on the one hand self-stigmatization and shame and regional suicide rates on the other, can be explained in two different ways. A first explanation assumes an indirect relation through help-seeking for psychological problems, whereby help-seeking is a protective factor of suicide (Deisenhammer et al., 2007). Study 4 shows that people who experience stigmatization and shame are less inclined to seek help. Furthermore, self-stigmatization and shame not only determine if someone seeks help or has the intention to seek help. Self-stigmatization and shame also can cause people to delay help-seeking (Henderson et al., 2013), and influence treatment preferences (Van Voorhees et al., 2003) and treatment adherence (Gabriel & Violato, 2010). Paper 5 shows that regional suicide rates are associated with the intention to seek informal help. A stronger intention to seek informal help could imply the presence and availability of a supporting and non-stigmatizing environment. This is in accordance with our finding of Paper 6, where male suicide rates were associated with the percentage of people who had somebody to discuss intimate and personal issues with. The association between suicide rates and professional help-seeking is, possibly because of a relatively low number of regions (n= 20), only near significant. The relationship between self-stigma and suicide rates disappears after controlling for informal help. This finding suggests that the relationship between self-stigmatization and suicide rates is mediated by the intention to seek help, which supports the assumption of an indirect relation between self-stigmatization and suicide rates.
The relationship between shame and suicide rates maintains its significance even after controlling for help-seeking intentions, what possibly implies a second and direct association with suicide. An explanation could be found in the diathesis-stress model (Van Heeringen, 2012). This model assumes that some people are, more than others, vulnerable to develop suicidal thoughts. When already vulnerable people are confronted with additional stress, they have an increased risk to exhibit suicidal behavior. Specifically, we assume that someone with psychological problems has an elevated vulnerability for suicidal behavior. Experiencing self-stigma and shame are additional stressors, which can result in lowered self-esteem and less self-efficacy (Rüsch et al., 2009). This additional stress in combination with the already existing vulnerability (diathesis), can bring someone into a suicidal crisis.

People with a suicidal past more often have accepting attitudes toward suicide in comparison to people without a suicidal past. Dutch people more often have a tolerant attitude toward suicide than Flemish people.

These findings can be interpreted in several ways. A first possibility is that people who have conducted suicidal behavior or consider doing this, are characterized by more accepting attitudes toward suicide (Arnautovska & Grad, 2010; Gibb et al., 2006). From our results, it seems indeed that people who have a suicidal past, have more positive attitudes toward suicide than people without suicidal past. This observation suggests that positive attitudes toward suicide are associated with an increased risk of suicide. A second and opposite interpretation is that a rather disapproving attitude toward suicide is a risk factor of suicide. Disapproving attitudes are assumed to be a barrier to disclose psychological problems and seek help (Renberg et al., 2008). According to the latter argumentation, people in the Netherlands would have more tolerant attitudes toward suicide compared to Flanders. This is in accordance with our observation that Dutch men more often found suicide acceptable and normal than Flemish men. Flemish men and women on the other hand, more often found suicide selfish, cowardly and a sign of weakness compared to Dutch people. It seems thus that attitudes toward suicide interfere in two opposite ways with suicide risk.

Flemish versus Dutch culture

The difference in Flemish and Dutch suicide rates could possibly be explained by the way in which both populations cope with stressful events (C. Van Heeringen, 2007). Hofstede and Hofstede (2005) pointed out that, despite their many resemblances, Flanders and the Netherlands differ strongly with respect to their cultural characteristics. Bonneux & Huisman (2009) concluded that there is 'something' in the Dutch culture that protects against suicide, while there is 'something opposite' in the Flemish culture that entails despair. Study 4 showed that Flemish people expect more stigmatization and more often experience self-stigmatization and shame when they would seek help compared to Dutch people. Study 3, found an association between human values and suicide rates in 11 West-European countries. This raises the question if the differences in coping, health care use and also in health care availability, can be explained by cultural differences between Flanders and the Netherlands. Answering this question is a delicate matter because available data are not without criticism and we must be aware not to reason in terms of stereotypes. In an attempt to discuss this question, we make use of the book of Claes and Gerritsen (Claes & Gerritsen, 2011), who interpret differences between Flanders and the Netherlands on the basis Hofstede's culture dimensions. However, caution is needed when applying these dimensions on Flanders and Netherlands. First, interpreting Flemish and Dutch cultural dimensions scores in relation to attitudes, help-seeking and suicide are hypothetical and even speculative. Second, the data were gathered about 30 years ago and thus somewhat dated. Third, the studies were conducted among managers of a multi-national company and thus not representative for the

entire population. Fourth, countries are assumed to be homogeneous entities without intra-national variances. Considering these limitations, we will attempt in the next paragraph to associate the general Flemish and Dutch culture with our findings.
A first observation is that Flemish people are more 'uncertainty avoiding' than Dutch people (Gerritsen, 2001). This suggests that Flemish people experience more stress and anxiety when confronted with changes and the unknown. It is argued that suicide can be seen as an ultimate form of control, the only way to gain control over life. The wish to avoid uncertainty can go along with the desire to resolve problems efficiently and rapidly. Possible, this expresses itself in Flanders in a higher consumption of antibiotics or for example in the fact that planned home birth without epidural anesthesia is an exception in Flanders, but more common in the Netherlands (Claes & Gerritsen, 2011). A medical, scientific approach also creates a greater feeling of confidence and efficiency. A psychotherapeutic approach possibly seems more uncertain in its progress and result. This could explain why in our study Flemish people are more medically oriented and Dutch people are more willing to consult psychotherapists.

Second, the Flemish culture is rather masculine while the Dutch culture is more feminine (Gerritsen, 2001; Hofstede, 2001). A feminine culture implies that there is more space for communication and that there is also a greater openness toward vulnerability (Claes & Gerritsen, 2011). The willingness to discuss personal vulnerability is a presumption for an effective psychotherapy. Openness to communication and vulnerability in a feminine culture possibly explains why Dutch people are more than Flemish people inclined to consult a psychotherapist and go into counseling. Our research also shows that Flemish people experience more self-stigmatization and that they experience more shame than Dutch people. This can be explained as well by the masculine Flemish society, which attaches more importance to status and prestige (Claes & Gerritsen, 2011). Within a masculine culture, people are presumably more inclined to conceal possible signs of weakness, which is often associated with a psychological problem.

Third, the difference in openness determines the extent to which Flemish and Dutch people permit others to gain access into their lives (Claes & Gerritsen, 2011). A Flemish person would be more often characterized by a greater need of private space. Just as the typical Flemish home, where it is hard to squeak inside because of high fences or closed curtains, Flemish people also do not easily let others look into their emotional world. And thus again, compared to Dutch people, Flemish people are less inclined to seek psychological help and they experience more self-stigma and shame if they were in need for help.

Fourth, a masculine culture is often associated with more 'power distance' (Gerritsen, 2001; G. Hofstede, 2001). In Flanders, people attach more importance to the opinion of an expert and they are less inclined to question this. Flemish people expect more than Dutch people that superiors say what subordinates have to do. In the Netherlands, people already learn in elementary school to debate, to express their opinion and to take initiative (Claes & Gerritsen,

2011). One could apply this to the differences in treatment preference by arguing that Flemish people more easily consult a doctor/expert from whom they expect a clear diagnose and treatment. Dutch people would be more inclined to take an active role in identifying the problem and participating in the treatment. In other words, Dutch people are more willing to participate actively in their 'healing process', rather than that they 'outsource' their health and treatment to a medical doctor.

Fifth, there is an obvious difference between the Catholic Flanders and the Protestant Netherlands. This could also explain the difference in treatment preference (Claes & Gerritsen, 2011). Flemish people more often use psychotropic drugs because of their belief in the manufacturability of the future. In the Netherlands, people more often believe in predestination. This means that one's fate is determined at the moment of his birth. This does not mean however that Dutch people are inclined to undergo their fate. An individual is predestinated in a certain way and he is supposed to act upon this way. This means taking initiative, participating actively and taking responsibility.

This discussion contributes to our understanding of the cultural facilitators of help-seeking for psychological problems within a Dutch and Flemish context. But these cultural factors could also help to understand the organization of the mental health care, e.g. more general practitioners and pharmacies in Flanders and a better reimbursement of psychotherapy and stronger multi-disciplinary approaches among first line care givers in the Netherlands.

4. Recommendations

Quality of suicide statistics

According to WHO (2014), registration and monitoring of suicidal behavior is of upmost importance to allocate suicide prevention means effectively and to develop and assess the effectiveness of suicide prevention policies. The WHO proposes a list of recommendations such as: establish a task force responsible for monitoring and improving suicide related data; conduct periodic assessment of the quality of suicide-related data; give preference to high-quality local data over poor-quality national data; find a balance between the need for local and the need for national data; integrate suicide monitoring in other activities; include stigma-reducing efforts; ensure that the monitoring system is used to assist suicide prevention activities. Although a one-size-fits-all strategy for all countries worldwide is unlikely to be feasible, we nevertheless advise to strive toward a more standardized procedure for the registration of suicide at a European level with special attention to: effective and clearly regulated communication channels between all authorities involved; clear guidelines for certifying procedures; sufficient training for certifiers and coders; sufficient availability of means and clear guidelines to conduct legal inquiry and forensic autopsy. Furthermore, it is

not only important to look at primary clues of suicide (e.g. a suicide note), but also at secondary clues (e.g. a psychological autopsy).

Preventing suicide by targeting self-stigma, shame and help-seeking

Stigmatization is the process of stereotyping, prejudice and discrimination among the general public. This implies that the characteristics (e.g. psychological problems) or behavior (e.g. help-seeking) of the stigmatized person are often perceived as abnormal or deviant. Self-stigmatization is the internalization of the perceived stigmatization, while shame can be seen as the emotional proxy of self-stigma. Shame refers to the feeling of being inadequate, defective, not good enough or not strong enough. This painful, social emotion is often caused by a comparison of the 'self' with 'self-standards' or with an ideal social context. Thus, shame is often triggered by unmet expectations or because of perceived rejection from others. Shame comes in many forms and intensities. For example we can feel embarrassed in front of others or feel inferior in terms of 'self' for needing psychological help.

Self-stigmatization and shame are risk factors of suicide in three ways: as a barrier toward psychological help-seeking; through a decrease of self-esteem and self-efficacy and; as an additional stressor above the already existing psychological problems. From a prevention point of view, it is important to acknowledge that stigma, self-stigma and shame are formed through socialization. In that sense, inducing shame is a way to regulate social behavior. In other words, feeling inadequate, inferior or ashamed for needing psychological help is partly learnt by society through socialization. Therefore, initiatives targeting self-stigma, shame and stigmatization could be an effective strategy for suicide prevention. As it is the case for suicide prevention in general (Hegerl, et al., 2009), we believe here too that the chances for success are highest when implementing a multi-level approach. We discuss a range of initiatives based on findings in the scientific literature, which we divide in actions aimed at the organization of mental health care and public information campaigns.

Actions aimed at the organization of mental health care

We argue that the organization of care can be modified in such a way that psychological help-seeking becomes more normal and more accepted. The aim should be to decrease stigmatization so that people experience less self-stigmatization and are less ashamed when in need of psychological help.

The general practitioner in Flanders is the most accessible care provider given his availability, psychological accessibility, confidentiality and financially limited cost. Because receiving specialized psychological help can increase the risk of labeling, offering mental help within the context of primary care could avoid separation of 'them' from 'us' and thus prevent stigmatization. This is why the general practitioner can play a crucial role for people to seek

psychological help, while experiencing less shame and self-stigma. To execute this important task, the general practitioner needs additional support such as vocational training with respect to providing psychosocial help; a financial allowance to compensate the additional time investment or; the implementation of a more explicit gate keeper function. Other measures contributing to a more adequate and accessible care are: setting up clear guidelines and offering support for a multidisciplinary collaboration among social workers, psychotherapists or first line psychologists and the general practitioner, the division of workload, effective referral and communication between different care providers; the recognition of the profession of psychotherapist and reimbursement of psychotherapy. The latter has proven to lower the barrier for specialized mental health care and in the meantime produce a health economical advantage for the community (Dezetter, Briffault, Lakhdar, & Kovess-Masfety, 2013).

Furthermore, Vogel et al. (2007) pointed out that people keep evaluating help-seeking behavior, even after they decided to seek help or after a first contact. Counselors should be aware of this and receive vocational training to discuss self-stigmatization and shame throughout the therapy. This is necessary to encourage therapy adherence.

Because the majority of suicidal people has problems with social functioning and maintaining social networks, psychosocial support must be sufficiently available and easily accessible (Wasserman et al., 2012). Therefore, it is advised to invest in the publicity of primary care such as the Centers for General Well-being. The offer of self-help and anonymous help can be further expanded by continuing to support crisis help lines and by developing an interactive online mental health care service. First line psychosocial support should give sufficient attention to the resilience of the help seeker, to the supportive role of informal networks and to health promotion.

Public information campaigns

At this moment there is initial evidence for the efficacy of public information interventions, such as intense collaboration with public media, poster campaigns, flyer distribution and online information tools to reduce stigma and self-stigma and increase mental health literacy. However, the impact is often found to be limited and the preventing effect on suicide is unclear (Rüsh et al., 2014).

Today, social support is often only seen as indirectly related to suicide. However, our study found an association between stigma, informal help-seeking and suicide rates. The majority of people in our study has the intention to seek informal help, but we also found that stigma and shame are important barriers to seek help. Therefore, more attention should go to social support and the supporting role of the family, friends, colleagues and peers (Wasserman et al., 2012). The Flemish Suicide Prevention Action Plan has brought this to the attention in the goal 'increasing supporting skills of parents'. This goal is however vaguely formulated.

Thus, there is additional need for psycho-education of the general public. One strategy is educating the public in 'mental health first aid skills' (Jorm et al., 2008), about how to communicate and act when knowing someone who has psychological problems. This could also be achieved by 'contact-based approaches' facilitating interactions between people with experiences with psychological problems and the community. Indeed, research shows that social contact with people who have (had) psychological problems, has a positive effect on attitudes toward psychological problems (Corrigan, Sells, Niessen, & Watson, 2007; Reinke, Corrigan, Leonhard, Lundin, &Kubiak, 2004). Another, seemingly paradoxical strategy in decreasing stigmatization, is promoting and supporting 'coming out'. It is argued that strategic disclosing or not concealing psychological problems is a way to regain one's self-esteem, self-efficacy and identity and leads to a sense of personal empowerment resulting in less self-stigmatization and shame (Corrigan et al., 2013). In supporting these actions, the emphasis should be laid on the fact that everyone can develop psychological problems and that these problems are treatable. Normalizing a problem could decrease the barrier to seek help. Additionally, there could also be focused on empowerment whereas help-seeking is described as a courageous act and not as a sign of weakness. Finally, previously received psychological help causes people to develop more positive attitudes toward psychological help and decreases experiences of shame and self-stigma (Angermeyer & Dietrich, 2006). 'Familiarizing people with mental health care' from a young age, could help to diminish the taboo surrounding psychological problems and can contribute to normalize psychological help-seeking. For example, medical exams in primary school can be extended with a psychosocial aspect. Students can be made familiar with the working of the Centres for General Well-Being and the Centres for Mental Health Care. The effect of contact with psychological care providers on attitudes, shame and self-stigmatization however, needs further research.

5. Propositions for future research

In the discussion section we attempted to relate general cultural characteristics, that are broader than attitudes and stigma, with suicide rates. As shown in Study 3, cultural values play a significant role in understanding cross-national and intra-national variability of suicide rates. Therefore it is designated to take these regional cultural variations into account. Nevertheless, recent and representative research on this topic is limited and further research is needed.

Research found that there are associations between attitudes toward suicide and suicidal behavior. Based on scientific research we cannot make a clear statement about the causality of the relation, nor if this relation is positive or negative. In addition, existing attitudes toward suicide scales have a lack of validity. Longitudinal research and development of valid scales are necessary to investigate the relationship between attitudes and suicide.

In Study 4 we found evidence for the association between self-stigma, shame and help seek intentions and regional suicide rates in Flanders and the Netherlands. Nevertheless, more evidence across several countries is needed. Therefore it is desirable to set up similar studies in different European countries. In this regard, it is advised to include indicators of the (mental) health organization into the analysis and to analyze a sufficient number of countries and intra-national regions to assure statistical power.

We proposed to bring youngsters in contact with psychosocial help care, in order to make them familiar with psychological problems and to normalize informal and professional psychological help-seeking. The eventual goal is to limit self-stigmatization and shame as a result of help-seeking. However, as far as we know there is no evidence on the effectiveness of this strategy and further research is needed.

Our research raises a great deal of questions on the interaction between the organization of health care and the presence of stigma and attitudes toward psychological problems and help-seeking. On the one hand, we can state that attitudes and stigma influence the use of health care, but also that these attitudes influence the organization of mental health care. On the other hand, we could presume that the organization of health care influences or even maintains attitudes or stigma. A better insight in this interaction could help to organize care in a way that it is better adjusted to the needs of the population, that it stimulates positive attitudes and counters stigma. Potential adaptations are community based care, low barrier primary care and multidisciplinary psychological care, with a focus on health promotion and resilience. However, more research on this topic is needed.

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Professional career

Alexandre Reynders was born on July 30th, 1976 in Sint-Truiden, Belgium where he received his secundary education. He graduated as a Master in Sociology at the University of Ghent. He made his dissertation on “Centrality, cohesion and structural equivalence as a predictor of the accurary of the perception of social networks” [Centraliteit, Cohesie en structurele equivalentie als verklarende variabelen voor de nauwkeurigheid van de perceptie van sociale netwerken]. In 2001, he attained an additional master degree in European Integration and development - specialization Economic integration at the VUB - Solvay Business School – Institute of European Studies, Brussels.

In 2002, he started his professional career at the Centre for Suicide Prevention. His main tasks were scientific research, external communication and providing training in crisis intervention for care givers. It was in this context that he developed an interest in understanding differences between regional suicide rates.

After collecting the necessary funds for a research project on this subject, he started in 2008 as a PhD student at LUCAS, a centre for research and consultancy in health care at the KU Leuven. Here, he conducted research on regional differences between suicide rates in Belgium and the Netherlands.

In 2012, he started as lecturer and researcher at the Higher Institute of Family Studies. Today, he teaches Project work and Sociology. Furthermore, he conducts research on suicide within the family context.

List of Publications

Reynders, A., Scheerder, G., Van Audenhove, C. (2011). The reliability of suicide rates: An analysis of railway suicides from two sources in fifteen European countries. *Journal of Affective Disorders, 131*, 120-127.

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Summary

Suicide is worldwide one of the most important external causes of death. Nevertheless, suicide rates differ substantially between as well as within countries. This observation suggests that, besides individual factors, suicide is also determined by contextual factors. The aim of this thesis is to improve our understanding of the factors that predict differences between regional suicide rates. In doing so, we conducted four studies.

Research questions 1 (Study 1 - literature study): What are explanations for differences in suicide rates? Based on our literature study, we found a general agreement that official suicide rates underestimate the actual number of suicides. Furthermore, evidence was found for an association between socio-economic factors and suicide rates. Known risk factors on an individual level such as psychological problems and suicidality were only weakly associated with suicide rates. Some studies found a negative association between suicide rates and the number of SSRI descriptions and the existence of alcohol abuse prevention policies. However, the association between suicide rates and other types of health care and mental health policies were unclear. Some studies investigated the association between cultural factors and suicide rates but here too, the association was not univocal. Research explaining high rural suicide rates stressed the importance of attitudinal factors in understanding suicide, but empirical evidence on this subject is limited.

Research question 2 (Study 2 - paper 1): Are the official European suicide rates reliable? Our study on the reliability of railway suicides in 15 European countries shows that the underestimation of suicide rates is significant for the majority of countries and that the degree of underestimation differs substantially between countries. In the case of Flanders and the Netherlands the limited underestimation was similar.

Research question 3 (Study 3): Are Schwartz' Human Values associated with suicide rates? In this longitudinal study we collected data for socio-economic factors and suicide rates from the European Social Survey and Eurostat for 107 NUTS 2 - regions of 11 European countries. Here, the main conclusion is that the human value dimension 'Autonomy vs. Embeddedness' was the single consistent predictor of regional suicide rates. In regions where people gave more priority to values reflecting autonomy, suicide rates were lower in the years following.

Research question 4 (Study 4 - paper 3 - 6)**:** Are intentions, attitudes and stigma with respect to psychological help-seeking and attitudes toward suicide associated with regional suicide rates? In our population study we found that, compared to Flanders where suicide rates are 80% higher, people in the Netherlands had more positive attitudes toward help-seeking; they more often had the intention to seek help; they experienced less self-stigmatization and shame for seeking help; and more often had approving attitudes toward suicide. Flemish

people who had a history of psychological or suicidal problems less often received psychological help compared to their Dutch counterparts. Furthermore, informal help-seeking intentions were negatively, and self-stigma and shame related to help-seeking were positively associated with regional suicide rates in Flanders and the Netherlands. In conclusion, Flanders and the Netherlands do not differ with respect to the prevalence of risk factors such as psychological problems and suicidality, but they do differ with respect to protective factors related to help-seeking.

Based on our findings, we recommend that registration procedures to assess suicides should be standardized on a European level. Furthermore, informal networks, cultural values and attitudinal factors predict regional suicide rates and should therefore be taken into account when developing suicide prevention strategies.

Samenvatting

Suïcide is wereldwijd een van de belangrijkste externe doodsoorzaken. Zowel op nationaal als regionaal niveau kunnen deze suïcidecijfers sterk van elkaar afwijken. Deze vaststelling wijst er op dat suïcide, naast individuele factoren, ook bepaald wordt door contextuele factoren. Het doel van deze Thesis is om meer inzicht te verwerven in de verklarende factoren voor de verschillen tussen regionale suïcidecijfers. Daartoe voerden we vier studies uit.

Onderzoeksvraag 1 (studie 1 - literatuurstudie): Wat zijn de verklaringen voor verschillen tussen suïcidecijfers? Op basis van onze literatuurstudie stelden we vast dat suïcidecijfers een onderschatting zijn van het feitelijk aantal suïcides. Daarnaast vonden we aanwijzingen voor een associatie tussen socio-economische factoren en suïcidecijfers. Gekende risicofactoren op het individuele niveau zoals psychische problemen en suïcidaliteit, bleken slechts zwak geassocieerd met suïcidecijfers. Enkele onderzoeken vonden dat het aantal SSRI-voorschriften en de preventie van alcoholmisbruik negatief geassocieerd waren met suïcidecijfers. Echter, de associatie tussen suïcidecijfers enerzijds en overige vormen van zorgaanbod en het bestaan van een geestelijk gezondheidsbeleid anderzijds, is niet eenduidig. Andere studies onderzochten de associatie tussen culturele factoren en suïcidecijfers, maar ook hier resulteerde dit niet in duidelijke verbanden. Onderzoeken naar de verklaring voor de hoge rurale suïcidecijfers wezen op een mogelijk effect van attitudes op het voorkomen van suïcide. Empirische evidentie voor deze piste is echter schaars.

Onderzoeksvraag 2 (Studie 2 - paper 1): Zijn Europese suïcidecijfers betrouwbaar? Onze studie over de betrouwbaarheid van spoorwegsuïcides in 15 Europese landen suggereert de officiële suïcidecijfers een onderschatting zijn van het werkelijk aantal suïcides in de meerderheid van de onderzochte landen en dat de mate van onderschatting substantieel verschilt tussen de landen. Voor Vlaanderen en Nederland concluderen we dat de beperkte mate van onderschatting gelijkaardig is.

Onderzoeksvraag 3 (Studie 3 - paper 2): Zijn Schwartz' cultuurwaarden en sociaal – economische factoren geassocieerd met regionale suïcidecijfers? Een longitudinale analyse van 107 regio's in 11 Europese landen toont aan dat autonomie als culturele waarde de enige robuste predictor is van regionale suïcidecijfers. In regio's waar mensen meer belang hechten aan autonomie worden gekenmerkt door lagere suïcidecijfers.

Onderzoeksvraag 4 (Studie 4 - papers 3-6): Zijn intenties, attitudes en stigma met betrekking tot psychologische hulp zoeken en attitudes ten aanzien van suïcide geassocieerd met regionale suïcidecijfers? Dit bevolkingsonderzoek toont aan dat, in vergelijking met Vlaanderen waar de suïcidecijfers 80% hoger liggen, men in Nederland vaker positieve attitudes had ten aanzien van hulp zoeken; vaker de intentie had om hulp te zoeken; minder

vaak zelf-stigma en schaamte gerelateerd aan hulp zoeken ervaarden; en meer aanvaardende attitudes ten aanzien van suïcide had. Vlamingen met een verleden van psychische of suïcidale problemen, hadden minder vaak hulp gekregen dan Nederlanders met een verleden van psychische of suïcidale problemen. Bovendien bleken intenties om informele hulp te zoeken negatief en zelf-stigma en schaamte positief geassocieerd te zijn met regionale suïcidecijfers in Vlaanderen en Nederland. Samenvattend kunnen we stellen dat Vlaanderen en Nederland niet zo zeer verschillen inzake de prevalentie van risicofactoren zoals psychische of suïcidale problemen, maar wel inzake beschermende factoren gerelateerd aan het zoeken van psychologische hulp.

We adviseren om de procedure om doodsoorzaken te registreren te standaardiseren op Europees niveau. Bij de ontwikkeling van het suïcidepreventiebeleid zou voldoende rekening gehouden moeten worden met de rol van informele netwerken, culturele waarden, stigmatizering en attitudes inzake hulp zoeken.