Methods of suicide: international suicide patterns derived from the WHO mortality database

Vladeta Ajdacic-Gross,[a] Mitchell G Weiss,[b] Mariann Ring,[a] Urs Hepp,[c] Matthias Bopp,[d] Felix Gutzwiller[d] & Wulf Rössler[a]

Objective Accurate information about preferred suicide methods is important for devising strategies and programmes for suicide prevention. Our knowledge of the methods used and their variation across countries and world regions is still limited. The aim of this study was to provide the first comprehensive overview of international patterns of suicide methods.

Methods Data encoded according to the International Classification of Diseases (10th revision) were derived from the WHO mortality database. The classification was used to differentiate suicide methods. Correspondence analysis was used to identify typical patterns of suicide methods in different countries by providing a summary of cross-tabulated data.

Findings Poisoning by pesticide was common in many Asian countries and in Latin America; poisoning by drugs was common in both Nordic countries and the United Kingdom. Hanging was the preferred method of suicide in eastern Europe, as was firearm suicide in the United States and jumping from a high place in cities and urban societies such as Hong Kong Special Administrative Region, China. Correspondence analysis demonstrated a polarization between pesticide suicide and firearm suicide at the expense of traditional methods, such as hanging and jumping from a high place, which lay in between.

Conclusion This analysis showed that pesticide suicide and firearm suicide replaced traditional methods in many countries. The observed suicide pattern depended upon the availability of the methods used, in particular the availability of technical means. The present evidence indicates that restricting access to the means of suicide is more urgent and more technically feasible than ever.

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Une traduction en français de ce résumé figure à la fin de l'article. *Al final del artículo se facilita una traducción al español.* الترجمة العربية لهذه الخلاصة في نهاية النص الكامل لهذه المقالة.

Introduction

Restricting access to the means of suicide is an important component of comprehensive strategies for suicide prevention. To improve prevention efforts, better knowledge of national, regional and local suicide patterns is vital, and better understanding of underlying mechanisms is absolutely crucial.

National studies on suicide indicate that suicidal behaviour and, in particular, the preferred suicide method, varies between countries. Some patterns are well known, such as the high percentage of firearm suicides in the United States of America.[1] In addition, the role of pesticide suicide in Asian countries became apparent in the 1990s.[2,3] The emergence of a new method, charcoal-burning suicide, in Hong Kong Special Administrative Region (SAR), China and urban Taiwan, China,[4,5] has been a surprise, but serves as a warning that research and prevention efforts should be reinforced.

While numerous factors contribute to the choice of a suicide method, societal patterns of suicide can be understood from basic concepts such as the social acceptability of the method (i.e. culture and tradition) and its availability (i.e. opportunity).[6,7] International or intercultural comparisons of suicide methods help increase understanding of the interplay between these two factors and provide a basis for preventive strategies.[8–10]

The aims of this study were:

- to provide, for the first time, a comprehensive international comparison of suicide methods using WHO mortality data (i.e. data collected in a standard way);
- to use correspondence analysis (a data reduction technique) to identify underlying patterns in the data;
- to contribute to discussions on the impact of the availability and acceptability of suicide methods on suicide behaviour;
- to draw conclusions about suicide prevention.

Methods

The data presented below were derived from the WHO mortality database (http://www.who.int/whosis/mort/en/index.html) on 17 November 2006. The database includes data gathered since 1950 and is dedicated to collecting and making available data on the underlying cause of death in all Member States using a standard format. Several countries have not reported mortality data to the WHO, or have reported data covering only a few years.[11] Others have reported only partial data, for example, on subpopulations or regions. However, the database also provides estimates of the

[a] Psychiatric University Hospital, Militärstr. 8, POB 1930, 8021 Zurich, Switzerland.
[b] Swiss Tropical Institute, Basel, Switzerland.
[c] Psychiatric Services of the Canton of Aargau, Baden, Switzerland.
[d] Institute of Social and Preventive Medicine, University of Zurich, Zurich, Switzerland.
Correspondence to V Ajdacic-Gross (e-mail: vajdacic@dgsp.uzh.ch).
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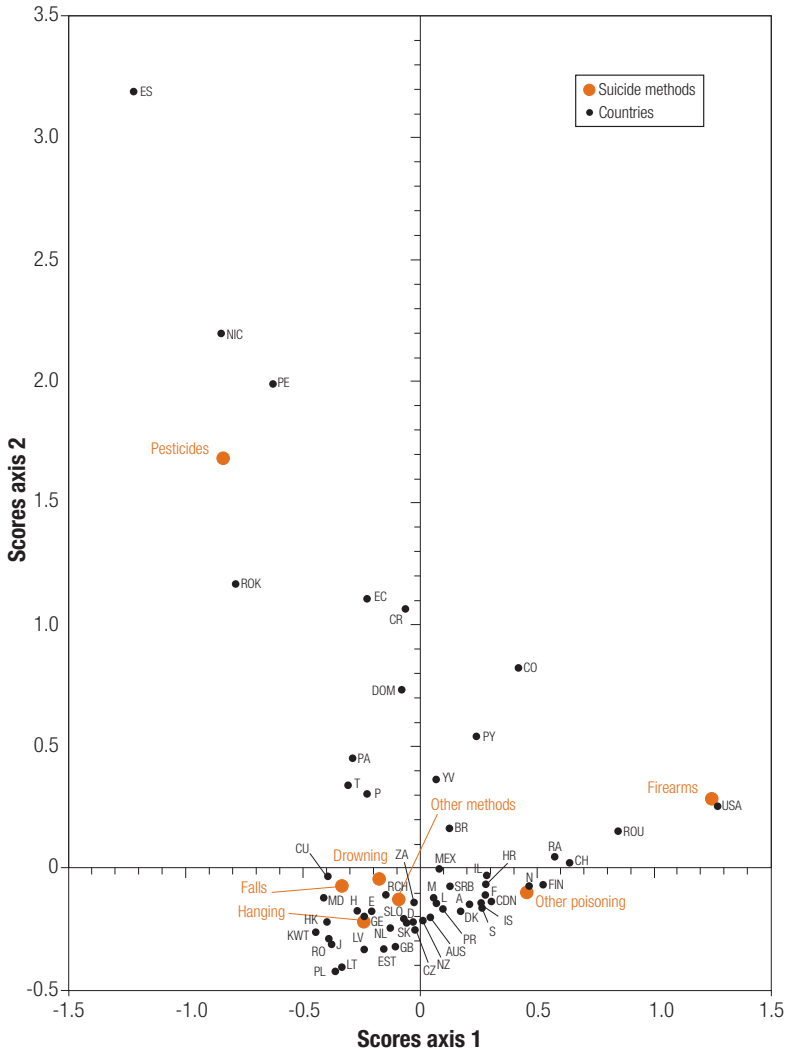
completeness and coverage of mortality data for each reporting country. Data for industrialized countries are most complete, whereas those for developing countries and conflict regions are often incomplete or missing altogether.

For this study, detailed information about suicide methods was extracted from WHO mortality data only if it was encoded according to the International Classification of Diseases, 10th revision (ICD-10). Since not all countries report mortality data to this standard, the study relied on only a selection of countries. In particular, countries from Africa were absent, except South Africa. In addition, countries with small populations, and thus few suicides, were excluded. In total, 56 countries and all the years covered by ICD-10 data, 1994–2005 at most, were included in the analysis, though the time span varied slightly from country to country (Table 1, available at: http://www.who.int/bulletin/volumes/86/9/07-043489/en/index.html).

The ICD-10 codes for suicide are in the range X60–X849. We differentiated suicides due to a pesticide or an unspecified poison (X68–X699), other poisons (X60–X679), hanging (X70–X709), drowning (X71–X719), firearms and explosives (X72–X759), and jumping from a height (X80-X809), and other suicide methods. Some methods, such as hanging or firearm suicide, are reported more accurately than others, such as poisoning or drowning.[12] This should be kept in mind when interpreting frequency distributions, particularly in countries with incomplete data.

To provide an overview of suicide methods by country, we calculated the number of suicides with each method as a proportion of the total number of suicides for each sex and country. In addition, we used correspondence analysis (CA)[13,14] to summarize information from cross-tabulated data. In practice, CA converted data into a graphical form that grouped countries with similar suicide method patterns. Metaphorically, a new map of the world is emerging in which countries are grouped into quasi-continents on the basis of suicide methods (or groups of suicide methods). The analysis was repeated separately for European and non-European countries.

Fig. 1. **Correspondence map based on suicide frequencies, in men in the years close to 2000, for different suicide methods and countries**[a]



A, Austria; AUS, Australia; BR, Brazil; CU, Cuba; CH, Switzerland; CDN, Canada; CO, Colombia; CR, Costa Rica; CZ, Czech Republic; D, Germany; DK, Denmark; DOM, Dominican Republic; E, Spain; EC, Ecuador; ES, El Salvador; EST, Estonia; F, France; FIN, Finland; GB, United Kingdom of Great Britain and Northern Ireland; GE, Georgia; H, Hungary; HK, Hong Kong Special Administrative Region, China; HR, Croatia; IL, Israel; IS, Iceland; J, Japan; KWT, Kuwait; L, Luxembourg; LT, Lithuania; LV, Latvia; M, Malta; MD, Moldova; MEX, Mexico; N, Norway; NIC, Nicaragua; NL, Netherlands; NZ, New Zealand; P, Portugal; PA, Panama; PE, Peru; PL, Poland; PR, Puerto Rico; PY, Paraguay; RA, Argentina; RCH, Chile; RO, Romania; ROK, Republic of Korea; ROU, Uruguay; S, Sweden; SK, Slovakia; SLO, Slovenia; SRB, Serbia; T, Thailand; USA, United States of America; YV, Venezuela; ZA, South Africa.
Source of country abbreviations except HK and PR: http://www.unece.org/trans/conventn/Distsigns.pdf
[a] Scores on each dimension represent distances from the average method or country profile.

Correspondence analysis is an exploratory multivariate technique that is very similar to principal component analysis (PCA). In CA, the 'extraction' of dimensions is related to the χ^2 distance, which is the measure of association (analogous to the correlation in PCA). A minimum number of dimensions is sought to account for the maximum amount of the inertia (analogous to the total variance in PCA). The inertia is a weighted measure of the total χ^2 (that is, χ^2/N).

Correspondence analysis relies on standardized row or column profiles, or both. Because of standardization, the proportion of suicides by a particular method in each country contributes similarly to the CA results. Typically, the first or the first two dimensions extracted in CA are used to display the results in correspondence maps. Scores on these dimensions represent distances from the average row and column profile (i.e. the country and method profile, respectively). The distance between any

two points is analogous to the weighted Euclidian distance.

Despite symmetrical standardization along both the row and column profiles used in this study, interpretations based on the cross-comparison of distances between countries and suicide methods should be avoided. It is advisable to focus on similar directions from the zero point, however, and to consider the distance from the zero point separately for each variable.

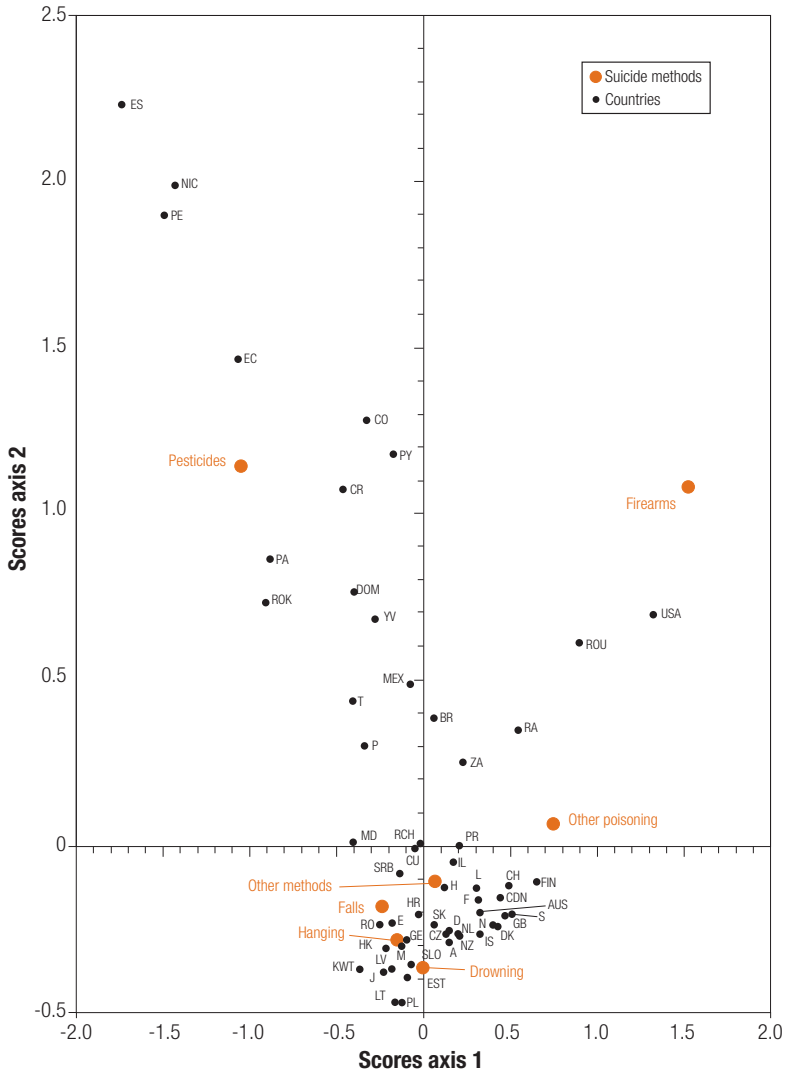
Among the problems which may arise in applying CA is the possibility that a straight sequence of objects or data points may be displayed in a curvilinear or pyramidal way. This phenomenon is called the 'arch effect', which derives from unimodal response curves or from the compression of distances at the ends of an axis, generally the first axis. In such cases, only the first axis, rather than two axes, is included in data interpretation. Alternatively, another CA technique (e.g. detrended CA) can be used.

Results

Hanging was the predominant method of suicide in most countries included in the analysis (Table 1). The highest proportions were around 90% in men and 80% in women, as observed in eastern Europe (i.e. Estonia, Latvia, Lithuania, Poland and Romania). There were a number of deviations from the predominant pattern. As might be expected, firearm suicide was the most common method in the United States, but was also prevalent in Argentina, Switzerland and Uruguay, although only men used this method in Switzerland. Jumping from a height (designated as falls in the figures) plays an important role in small, predominantly urban societies such as Hong Kong SAR, Luxembourg and Malta. In contrast, in rural Latin American countries (e.g. El Salvador, Nicaragua and Peru), Asian countries (e.g. the Republic of Korea and Thailand) and also in Portugal, poisoning with pesticides was a major problem, notably among women. Poisoning with drugs was common in women from Canada, the Nordic countries and the United Kingdom. It also played an important role in male suicide in these countries.

The well-known differences between men's and women's preferred suicide methods can also be seen in

Fig. 2. **Correspondence map based on suicide frequencies, in women in the years close to 2000, for different suicide methods and countries**[a]



For country codes, see Fig. 1.

[a] Scores on each dimension represent distances from the average method or country profile.

Table 1. Violent and highly lethal methods such as firearm suicide and hanging are more frequent among men, whereas women often choose poisoning or drowning, which are less violent and less lethal.

Correspondence analysis for all countries yielded the correspondence maps shown in Fig. 1 for men, and Fig. 2 for women. In the men's data, the first two dimensions accounted for 84.5% of the inertia; in the women's data, it accounted for 77.1%. In the figures, pesticides, hanging (and other methods) and firearms form a triangle. In addition, the countries with the highest proportions of pesticide poisoning and firearm suicide listed above also define the triangle apices. Hanging is in an intermediate position since it is more frequent than firearm suicide in almost all countries with a high proportion of pesticide suicide. Conversely, hanging is more frequent than pesticide suicide in almost all countries with a high proportion of firearm suicide. Thus, there are two slopes: one from hanging to pesticide suicide and the other from hanging to firearm suicide. This is the typical arch effect observed in CA. To be safe, we should not interpret these CAs using the second axis. The first axis should be kept in mind, on which the poles are pesticide suicide and firearm suicide (and, to a lesser extent, other poisoning), with hanging and other methods lying in between.

The correspondence maps for non-European countries (Fig. 3 and Fig. 4, available at: http://www.who.int/bulletin/volumes/86/9/07-043489/en/index.html) show similar results. The amount of the inertia accounted for by the first two axes in the CA was 90.7% for suicide in men and 87.5% for suicide in women. Clearly, there is also an arch effect here. Again, the countries mentioned above defined the slopes between the middle and the poles.

The correspondence maps for European data (Fig. 5 and Fig. 6, available at: http://www.who.int/bulletin/volumes/86/9/07-043489/en/index.html) show a different pattern. Here, the amount of the inertia accounted for by the first two axes was 77.3% for suicide in men and 74.7% for suicide in women. Again, hanging occupied a central position in both men's and women's plots. The first axis divided countries in central and western Europe, where there was a more mixed pattern, from countries in eastern and southern Europe, where hanging distinctly predominated but was partly supplemented by a moderate proportion of pesticide suicide. On the second axis, the poles are represented by firearm suicide in men and other poisoning in women, and by jumping from a height (i.e. falls) and other methods. For men, the firearm suicide quadrant includes Croatia, Serbia and Switzerland. Firearms were probably widely available in Croatia and Serbia following the civil war in the 1990s. In addition, Finland, France and Norway also appear in this quadrant. For women, the analogous quadrant relates to drug suicide (i.e. other poisoning) and includes the United Kingdom and Nordic countries. The quadrant of the opposite pole of jumping from a height includes Luxembourg, Malta and Spain.

The European data differ from those in the previous analyses. Instead of forming an arch-like pattern, suicide methods and countries are distributed more loosely over all four quadrants. The polarization between pesticide and firearm suicide has mostly vanished due to the modest proportion of pesticide suicide. In addition, distances along the figure axes are clearly smaller than in previous plots; that is, the country patterns are distinctly more similar. Moreover, it is noteworthy that the position occupied by firearm suicide in men is replaced by other poisoning (i.e. mainly drug suicide) in women. It seems that there is some functional equivalence between these suicide methods in Europe.

Discussion

This paper reports the first comprehensive compilation of methods of suicide worldwide based on WHO mortality data, with the caveat that data for Asian and, above all, African countries are incomplete. Data were submitted to a correspondence analysis to identify typical configurations across countries.

International comparison of suicide methods

In sum, the differences in the suicide methods used in different countries are remarkable. Three methods – hanging, pesticide suicide and firearm suicide – dominate country-specific suicide patterns. Jumping from a height and other methods of poisoning (i.e. mainly poisoning by drugs) occasionally appear as important alternative methods.

The analysis indicates that hanging is the main suicide method when no other major method is available. The proportion of hangings typically decreases as either pesticide suicide or firearm suicide increases. Pesticide suicide has been recognized as a major public health problem in developing Asian countries.[15–17] It has been known for some time that firearms affect the suicide frequency, and firearm suicide predominates in several countries in the Americas and also in some European countries. Firearm suicide is frequent in countries where firearms are common in private households.[18,19]

Underlying patterns identified by the correspondence analysis

Correspondence maps make large tables easier to interpret and are helpful in developing new hypotheses. Moreover, they can demonstrate valuable patterns despite data being noisy or incomplete. And, countries absent from the list can be added afterwards.

The first, and surprising, finding from the CA is that the correspondence maps for men and women are very similar. This is because there is a much larger difference in suicide methods between countries than between genders. Where a suicide method is particularly popular in men, it will often also be popular in women, and *vice versa*. In general, underlying suicide patterns tell us more about the availability and acceptability of suicide methods than about gender disparities.

The European data, however, provide a notable exception to the congruence between men and women. Here, in the women"s correspondence map, suicide by other poisoning (mainly poisoning by drugs) has replaced firearm suicide in the men's map. Assuming there is functional equivalence, we are drawn to the conclusion that unplanned or impulsive suicide in European women is mainly achieved by poisoning using drugs.

Correspondence analysis of all countries and of the subset of non-European countries provides evidence for a polarization between suicide methods. The poles are pesticide suicide and firearm suicide, while hanging is in an intermediate position. This polarization has several implications.

Firstly, at the poles, hanging and other more traditional suicide methods are displaced by suicide methods whose main characteristics are utilization of a technical means, ready availability, quick use and high lethality. For pesticide and firearm suicide, the impact of availability seems to be greater than for traditional suicide methods.

Secondly, the opposite slopes seen in the correspondence maps and the degree of displacement indicate that there is a substantial substitution effect: pesticide suicide and firearm suicide are not only associated with new suicide behaviour, but also tend to substitute hanging. The introduction of specific prevention programmes focusing on pesticides or firearms would be expected to reverse this substitution to some extent. In fact, this reversal was observed when firearm availability was restricted in Australia[20] and Canada:[21] at the same time, the proportion of suicides due to hanging increased.

Readily available poisons and firearms facilitate unplanned suicide acts,[22,23] which are typical of impulsive suicide. Consequently, they increase the suicide frequency. It is noteworthy that the proportion of suicides in individuals with a background of severe mental illness is distinctly below average in firearm suicide.[24,25] This observation holds for both Asian and European countries.

Availability and acceptability of suicide methods

It is generally assumed that the use of hanging and other traditional suicide methods is largely governed by their acceptability and by sociocultural norms. While acceptability provides a general framework of beliefs about whether or not to commit suicide and which method to use, sociocultural norms provide a framework for how to proceed, for example, in how to deal with obstacles to suicide.

Hanging, for example, is a selective method because:

- it is violent;
- it needs some preparation;
- it needs some degree of courage and determination.[26]

Each method has its own particular obstacles. Typically, the greater the obstacles, the lower the acceptability of the method and the greater the proportion of suicides associated with psychosis and other severe mental disorder.

This study indicates that the availability of technical means has a large influence on the acceptability of a specific method and, indirectly, of suicide in general. In historical terms, the introduction of pesticides in developing countries is too recent to have contributed to the emergence of traditional sociocultural norms. It has, though, lead to new norms and to new links with acceptability. A theoretical background to such processes is provided by the concept of an 'opportunity structure', as introduced by Cloward and Ohlin.[27] The potential a new technical means has to win favour quickly among suicidal individuals is a cause of concern. Charcoal-burning suicide might not be the last such phenomenon.

Implications for suicide prevention

Given that the relationship between the availability of suicide methods and the level of suicide is principally mediated by firearm and pesticide suicide, it could be concluded that these two methods should be the main targets for prevention. In practice, many deaths due to pesticide poisoning and firearm suicide could easily be prevented if progress in public health were to outweigh the inertia of political and economic interests.[28] However, the outcome is not certain. The above analysis indicates that we should differentiate between preventable suicides and suicides that will be carried out by hanging instead. With regard to poisoning and firearm suicide, preventive efforts are likely to have the greatest impact on the subgroup who carry out unplanned impulsive acts. Perhaps 20–30% of all suicides in industrialized countries belong to this subgroup and might be preventable, and a similar figure has been reported for China.[23]

In suicides that occur after a period of suffering, the relationship is more complex. As a first approximation, the balance between prevention and suicide method substitution depends, firstly, on the transition probability between suicide methods and, secondly, on the lethality of the particular method. The transition probability between two violent methods, such as firearm suicide and hanging, is presumably quite high and certainly much higher than between poisoning and a violent method.[29] The lethality of firearm suicide and hanging are similar, with 80–90% of attempts proving fatal, while lethality is markedly lower for poisoning.[8,30] Therefore, for suicide that occurs after a period of suffering, the prevention of firearm suicide would be expected to have little effect, whereas the prevention of poisoning may be well worth considering. Nevertheless, there remains the question of whether the low transition probability between poisoning and a violent method outweighs the higher lethality of the latter. Studies on the detoxification of household gas[9,31] suggest that there is a substantial preventive effect in "closing such exits".[26] However, analysing longitudinal data on changes in suicide methods involves considerable methodological problems, particularly when sophisticated statistical techniques and long time series are not available.[10,32,33]

Study strengths and limitations

Although the WHO mortality database provides the most comprehensive source of mortality data collected in a standard way, data from many countries are incomplete. In particular, ICD-10 encoded data cover only certain parts of the world. It should be noted that ICD-9 encoded data in the WHO database do not distinguish between suicide methods.

In addition, there is a degree of underreporting of suicide. A useful indicator of underreporting is the number of violent deaths which cannot be classified as either intentional or unintentional. This number varies between countries.[34] However, in the present analysis, the distribution of suicide methods is more likely to be influenced by differences in the way methods are reported. Specifically, violent methods, such as hanging, are reported more accurately than nonviolent methods, such as poisoning. Less violent suicide methods are more likely to be underreported. Pesticide poisoning may, therefore, be more important than the data indicate.

Another limitation stems from the different time periods covered by ICD-10 coded mortality data in different countries. However, as patterns of suicide methods typically change very slowly, this is a minor issue. Charcoal-burning suicide is an exception, which should be borne in mind.

Conclusions

There are substantial differences in the pattern of suicide methods internationally. These reflect the interplay of different determinants of suicidal behaviour,[6,8] primarily the availability of suicidal means. The present findings indicate that restricting access to the means of suicide is more urgent and more technically feasible than ever. Restriction would help to prevent mainly unplanned impulsive suicide. ■

Competing interests: None declared.

Résumé

Méthodes de suicide : détermination de schémas internationaux de suicide à partir de la base de données de mortalité de l'OMS

Objectif Il importe de disposer d'informations précises sur les méthodes de suicide préférentiellement appliquées pour concevoir des stratégies et des programmes de prévention du suicide. Nos connaissances sur les méthodes utilisées et sur leurs variations d'un pays ou d'une région du monde à l'autre sont encore limitées. Cette étude a pour objectif de fournir un panorama complet des schémas internationaux de méthodes de suicide.

Méthodes Des données, encodées selon la Classification internationale des maladies (10e révision), ont été tirées de la base de données de mortalité de l'OMS. Cette classification a servi à différencier les méthodes de suicide. L'analyse de correspondance a été utilisée pour identifier les schémas typiques de méthodes de suicide dans les différents pays, en fournissant un résumé des données tabulées.

Résultats L'empoisonnement par un pesticide est courant dans de nombreux pays d'Asie et en Amérique latine, tandis que l'empoisonnement médicamenteux est fréquent dans les pays nordiques et au Royaume-Uni. La méthode de suicide privilégiée est la pendaison en Europe de l'Est, le recours à une arme à feu aux États-Unis d'Amérique et le saut d'un endroit élevé dans les grandes villes et dans les sociétés urbaines comme la Région administrative spéciale de Hong-Kong, en Chine. L'analyse de correspondance a mis en évidence une polarisation entre le suicide au pesticide et le suicide par arme à feu, aux dépens des méthodes traditionnelles telles que la pendaison et le saut d'un endroit élevé, qui se situent entre les deux.

Conclusion L'analyse montre que le suicide au pesticide et le suicide par arme à feu ont remplacé les méthodes traditionnelles dans de nombreux pays. Le schéma de suicide observé dépend de la disponibilité des méthodes utilisées et notamment des moyens techniques de suicide. Ces éléments montrent que restreindre l'accès aux moyens de suicide est plus urgent et plus faisable techniquement que jamais.

Resumen

Métodos de suicidio: comparación internacional a partir de la base de datos de mortalidad de la OMS

Objetivo La disponibilidad de información precisa sobre los métodos de suicidio más frecuentes es importante para idear estrategias y programas de prevención del mismo. Nuestros conocimientos sobre los métodos empleados y las diferencias entre países y regiones mundiales siguen siendo limitados. La finalidad de este estudio fue trazar el primer panorama general de los perfiles de métodos de suicidio en el plano internacional.

Métodos A partir de la base de datos de mortalidad de la OMS se obtuvieron datos codificados de acuerdo con la Clasificación Internacional de Enfermedades (10ª revisión). Dicha clasificación se utilizó para diferenciar los métodos de suicidio. Se empleó el método de análisis de correspondencias para determinar los perfiles de los métodos de suicidio en los diferentes países mediante un resumen de los datos de tabulación cruzada.

Resultados Se observó que el envenenamiento por plaguicidas era frecuente en muchos países asiáticos y en América Latina, mientras que la intoxicación medicamentosa era frecuente en los países nórdicos y en el Reino Unido. El ahorcamiento era el método de suicidio preferido en Europa oriental, al igual que las armas de fuego en los Estados Unidos y el salto al vacío en ciudades y sociedades urbanas como la Región Administrativa Especial de Hong Kong, China. El análisis de correspondencias reveló una polarización entre el suicidio con plaguicidas y el suicidio por arma de fuego, situándose entre ambos y en retroceso los métodos tradicionales, como el ahorcamiento y el salto al vacío.

Conclusión Este análisis muestra que el suicidio con plaguicidas y el suicidio por arma de fuego tienden a reemplazar a los métodos tradicionales en muchos países. El perfil de métodos de suicidio depende de la disponibilidad de los métodos empleados, en particular de la disponibilidad de medios técnicos. La evidencia aquí aportada indica que la restricción del acceso a los medios de suicidio es más urgente y técnicamente viable que nunca.

ملخص

طرق الانتحار: الأنماط الدولية للانتحار المأخوذة من قاعدة بيانات منظمة الصحة العالمية الخاصة بالوفيات

الهدف: تُعَدْ المعلومات الدقيقة حول طرق الانتحار المفضلة مهمة لوضع الاستراتيجيات وبرامج الوقاية من الانتحار. فمعارفنا بالطرق المستخدمة، وتفاوتها عبر البلدان وأقاليم العالم لاتزال محدودة. والهدف من هذه الدراسة هو تقديم أول استعراض شامل للأنماط الدولية لطرق الانتحار.

الطريقة: أخذت المعلومات المرمزة وفقاً للتصنيف الدولي للأمراض (المراجعة العاشرة) من قاعدة بيانات منظمة الصحة العالمية للوفيات. واستخدم هذا التصنيف للتمييز بين طرق الانتحار. واستخدم التحليل المقارن في التعرف على أنماط طرق الانتحار المعتادة في مختلف البلدان من خلال توفير موجز لمعلومات الجداول المتعددة المداخل.

الموجودات: يشيع التسمم بمبيدات الهوام في العديد من البلدان الآسيوية وأمريكا اللاتينية؛ ويشيع التسمم بالأدوية في بلدان الشمال الأوروبي والمملكة المتحدة، في حين نجد أن الشنق هو الطرق المفضلة للانتحار في شرق أوروبا، والانتحار باستخدام السلاح الناري في الولايات المتحدة، والقفز من الأماكن المرتفعة في المدن والمجتمعات الحضرية مثل منطقة هونغ كونغ الصينية الإدارية الخاصة. وأظهر التحليل المقارن نوعاً من تزايد عدد المنتحرين باستخدام مبيدات الهوام، وباستخدام الطلق الناري أكثر من مستخدمي الطرق التقليدية مثل الشنق والقفز من الأماكن المرتفعة والذي يحتل مكانة وسطية بينهم.

الاستنتاج: أظهر التحليل أن الانتحار بمبيدات الهوام واستخدام الطلق الناري قد حلاً محل الطرق التقليدية في العديد من البلدان. واعتمد نمط الانتحار الذي تم ملاحظته على توافر الطرق المستخدمة، ولاسيَّما توافر الوسائل التقنية. وتشير البيِّنات الحالية إلى أن تقييد الوصول إلى وسائل الانتحار قد أصبح أكثر إلحاحاً وأكثر جدوى من أي وقت مضى.

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Table 1. **Suicide by method (% out of all suicides by country) according to the WHO mortality database (as at November 2006); countries reporting ICD-10 data**

Country[a]	Year	Men								Women							
		Other poisoning	Pesti-cides	Hang-ing	Drown-ing	Fire-arms	Falls	Other	*N*	Other poisoning	Pesti-cides	Hang-ing	Drown-ing	Fire-arms	Falls	Other	*N*
Africa																	
South Africa (ZA)	1996 & 2004	6.6	3.6	68.7	0.0	12.6	0.2	8.2	412	22.7	12.6	41.2	0.8	9.2	0.8	12.6	119
Americas																	
Argentina (RA)	1997–2003	0.7	1.7	49.1	1.5	37.6	2.4	7.0	15 214	3.4	4.1	38.0	4.2	25.9	10.3	14.1	4 188
Brazil (BR)	1996–2002	2.0	8.3	52.4	0.9	22.1	1.8	12.6	33 072	6.5	16.0	37.6	2.3	13.4	3.9	20.4	8 591
Canada (CDN)	2000–2003	10.2	0.4	44.4	2.3	21.6	4.7	16.3	11 419	34.3	05	36.8	4.0	3.8	6.5	14.1	3 288
Chile (RCH)	1997–2003	0.6	5.0	77.2	0.9	11.7	0.7	3.9	7 995	7.7	9.8	62.6	2.7	8.0	2.0	7.2	1 342
Colombia (CO)	1997–1999	5.9	20.1	27.7	1.1	37.0	3.1	5.1	4 243	12.5	45.7	17.4	1.2	15.0	4.2	3.9	1 292
Costa Rica (CR)	1997–2004	3.5	29.9	38.4	0.2	24.0	1.6	2.4	1 727	8.9	43.2	30.4	0.4	11.3	3.9	1.9	257
Cuba (CU)	2001–2004	1.7	8.9	76.8	0.6	3.4	2.0	6.6	4 620	11.5	10.3	27.4	1.3	0.7	3.0	45.8	1 649
Dominican Republic (DOM)	1996–2001	2.5	22.4	42.8	2.5	20.2	1.5	8.1	754	7.8	34.9	31.9	3.6	8.4	3.0	10.2	166
Ecuador (EC)	1997–2004	1.6	32.2	41.3	1.6	19.2	0.1	4.0	3 369	2.3	64.3	23.9	0.8	5.3	0.1	3.3	1 542
El Salvador (ES)	1997–2003	0.4	86.2	8.4	0.3	3.8	0.1	0.7	2 446	0.0	95.1	3.2	0.0	1.4	0.0	0.4	1 102
Mexico (MEX)	1998–2003	0.9	5.3	68.8	0.5	20.5	0.7	3.3	18 283	6.9	21.5	51.3	0.7	13.4	1.5	4.7	3 590
Nicaragua (NIC)	1997–2003	1.8	61.4	25.7	0.6	7.4	0.1	2.9	1 647	7.7	84.6	4.8	0.1	1.7	0.0	1.1	726
Panama (PA)	1998–2003	1.4	18.3	63.5	0.0	11.9	3.2	1.8	816	2.9	46.3	44.1	0.0	2.2	3.7	0.7	136
Paraguay (PY)	1996–2003	0.6	15.4	42.9	1.6	30.4	1.2	7.9	687	2.5	38.5	27.1	1.9	21.5	2.8	5.7	317
Peru (PE)	1999–2000	2.3	54.6	14.1	3.3	11.8	0.3	13.5	304	1.8	83.0	7.3	2.4	1.2	0.0	4.2	165
Puerto Rico (PR)	1999–2002	4.8	1.6	67.6	1.7	17.6	1.5	5.1	993	19.2	6.2	42.3	1.5	6.9	7.7	16.2	130
United States of America (USA)	1999–2002	7.1	0.3	20.4	0.9	60.6	1.9	8.8	97 014	31.0	0.5	16.9	2.1	35.7	3.4	10.5	23 629
Uruguay (ROU)	1997–2001	1.5	1.5	41.1	2.7	47.8	1.1	4.2	2 027	6.8	3.7	27.5	9.1	35.7	7.6	9.5	484
Venezuela (YV)	1996–2002	1.4	13.3	56.6	0.6	23.3	2.2	2.6	7 021	5.2	29.8	44.1	0.5	12.2	4.6	3.7	1 395
Asia																	
Hong Kong Special Administrative Region, China (HK)	2001–2004	1.6	1.1	22.6	2.0	0.3	43.3	29.1	2 866	3.5	2.4	18.9	4.5	0.1	47.5	23.1	1 556
Israel (IL)	1998–2003	2.5	1.9	42.0	0.7	25.4	10.3	17.2	1 511	8.9	2.9	31.1	2.1	9.1	21.9	24.0	383
Japan (J)	1995–2004	1.3	2.5	68.7	2.6	0.2	8.1	16.5	199 505	2.9	4.3	59.9	7.8	0.0	12.5	12.7	82 646
Kuwait (KWT)	1995–2001	0.5	4.7	91.7	0.0	0.5	0.5	2.1	193	0.0	7.3	90.6	0.0	0.0	2.1	0.0	96
Republic of Korea (ROK)	1995–2004	0.4	37.5	39.2	3.2	0.4	9.5	9.8	53 449	0.8	42.8	26.0	3.8	0.1	18.5	8.1	23 392
Thailand (T)	1994–2002	6.3	16.4	51.7	0.1	6.1	0.1	19.3	27 015	11.3	28.3	41.8	0.1	1.9	0.2	16.4	8 669

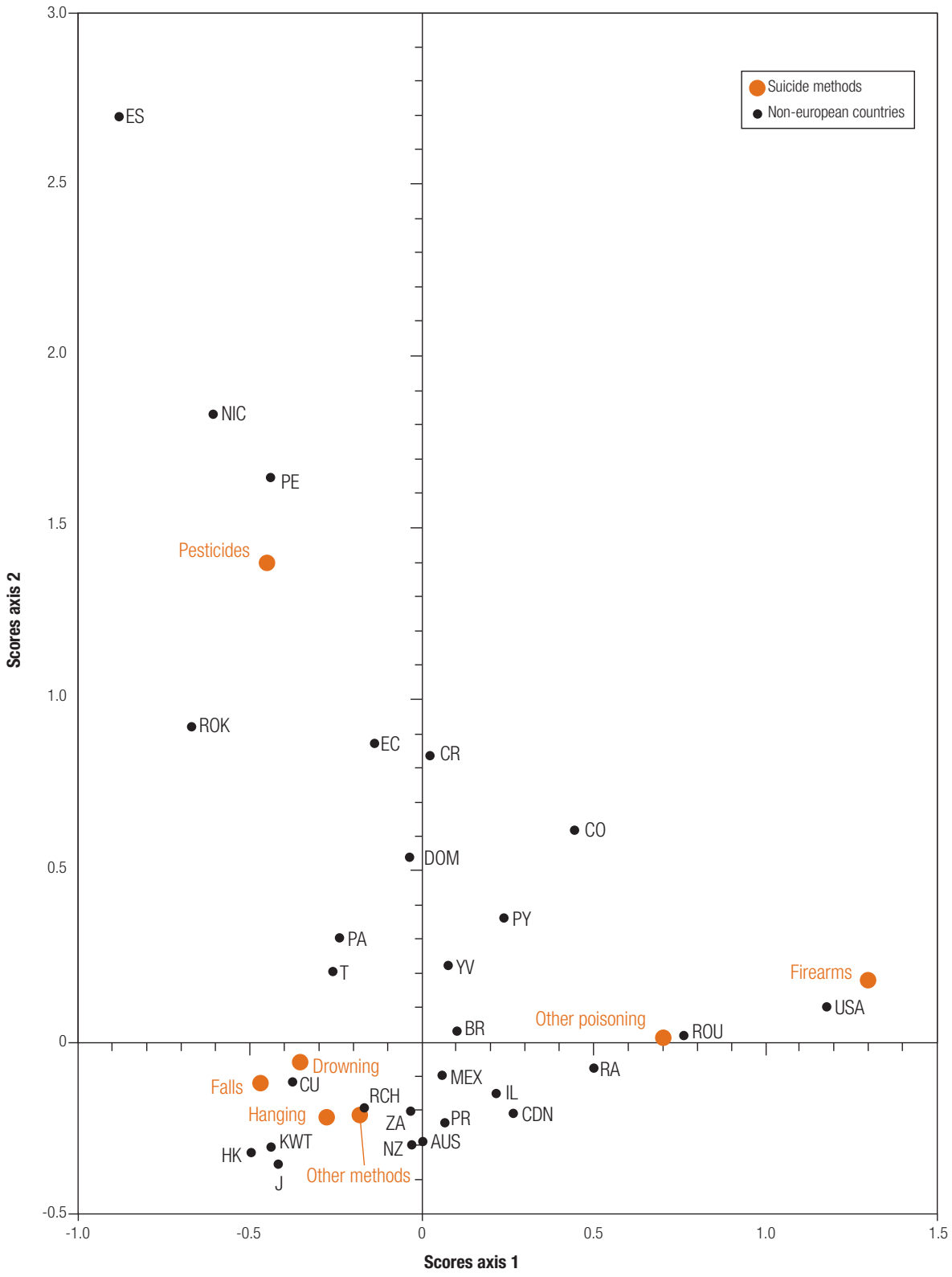
(Table 1, cont.)

Country[a]	Year	Men								Women							
		Other poisoning	Pesti-cides	Hang-ing	Drown-ing	Fire-arms	Falls	Other	*N*	Other poisoning	Pesti-cides	Hang-ing	Drown-ing	Fire-arms	Falls	Other	*N*
Australia & New Zealand																	
Australia (AUS)	1998–2003	8.0	1.1	45.4	1.3	11.5	3.6	29.1	11 422	26.5	0.7	36.4	3.9	2.6	4.6	25.3	3 017
New Zealand (NZ)	2000–2003	6.4	1.0	48.4	1.9	11.2	2.5	28.6	1 493	19.7	0.4	42.5	4.4	2.2	6.4	24.3	456
Europe																	
Austria (A)	2002–2005	5.6	0.3	48.1	3.3	20.7	8.9	13.1	4 373	17.7	0.6	35.2	10.7	2.6	18.1	15.1	1 444
Croatia (HR)	1995–2004	2.3	1.5	53.3	3.8	25.4	4.0	9.8	6 892	7.2	5.4	47.9	13.8	4.5	8.3	12.9	2 426
Czech Republic (CZ)	1994–2004	5.0	0.6	63.8	1.0	12.4	6.5	10.8	14 154	18.2	1.3	44.8	4.8	2.6	15.7	12.5	4 016
Denmark (DK)	1994–2001	13.7	0.7	40.7	4.8	14.5	5.1	20.5	4 645	36.9	0.7	29.6	13.2	0.8	7.9	10.7	1961
Estonia (EST)	1997–2005	1.5	0.2	79.7	0.5	9.1	3.3	5.7	2 874	9.1	1.9	70.4	2.2	1.3	10.7	4.3	689
Finland (FIN)	1996–2004	17.6	0.2	33.1	3.5	26.7	4.2	14.6	8 168	49.5	0.2	20.3	10.6	2.6	6.6	10.2	2 425
France (F)	2000–2003	8.6	1.0	48.9	3.9	22.1	4.9	10.6	31 378	26.3	2.0	29.2	12.4	4.1	12.4	13.5	11 387
Georgia (GE)	1998–2001	4.3	3.6	53.2	0.9	3.2	1.6	33.2	440	4.7	3.9	50.8	0.8	0.8	4.7	34.4	128
Germany (D)	1998–2004	8.0	1.3	55.5	2.1	10.3	7.4	15.5	57 202	22.0	2.0	38.9	7.2	1.4	14.1	14.4	20 870
Hungary (H)	1996–2003	7.0	4.6	70.3	1.4	4.0	4.9	7.8	19 030	28.1	7.0	43.4	4.5	0.6	9.9	6.5	6 089
Iceland (IS)	1997–2004	9.3	0.0	39.0	5.5	19.5	5.1	21.6	236	31.8	1.5	27.3	18.2	0.0	4.5	16.7	66
Latvia (LV)	1996–2004	0.9	1.0	85.1	0.6	6.5	2.3	3.6	5 367	6.2	4.1	72.6	3.9	0.9	7.8	4.5	1 359
Lithuania (LT)	1998–2004	1.1	0.4	91.7	0.3	2.7	1.3	2.4	8 778	6.3	1.6	83.1	2.2	0.3	4.4	2.1	1 881
Luxembourg (L)	1998–2004	8.1	1.1	38.2	2.8	14.6	18.5	16.6	356	29.6	1.6	15.2	7.2	3.2	28.8	14.4	125
Malta (M)	1995–2004	6.8	1.4	41.8	4.1	15.8	21.9	8.2	146	13.7	2.0	15.7	7.8	0.0	56.9	3.9	51
Moldova (MD)	1996–2004	0.9	7.0	80.3	2.0	2.4	2.6	4.8	4 596	5.0	18.0	55.7	9.1	0.5	5.4	6.2	933
Netherlands (NL)	1996–2004	11.7	1.4	47.9	6.6	4.4	7.8	20.2	9 211	24.0	1.8	33.6	11.0	0.6	10.7	18.3	4 526
Norway (N)	1996–2004	11.1	0.2	37.9	4.6	27.1	4.7	14.3	3 519	33.3	0.5	32.3	13.5	2.0	7.1	11.3	1 272
Poland (PL)	1999–2004	1.8	0.3	91.2	0.5	1.1	2.1	3.1	29 808	7.9	0.8	77.6	3.0	0.2	6.5	4.0	5 495
Portugal (P)	2002–2003	2.4	14.0	52.2	4.3	11.1	6.0	10.0	1 835	9.2	23.5	31.2	11.6	3.2	10.3	10.9	532
Romania (RO)	1999–2004	3.0	3.1	87.3	0.3	1.0	1.4	3.8	14 039	7.9	9.1	74.1	1.1	0.1	2.4	5.2	2 934
Serbia (SRB)	1997–2002	1.6	2.9	57.6	3.3	20.1	2.3	12.2	6 939	4.2	9.8	57.2	7.9	5.2	4.0	11.7	3 003
Slovakia (SK)	1994–2002	3.2	1.7	70.0	0.8	12.3	5.0	7.0	5 248	17.0	2.8	50.2	2.8	2.9	17.2	7.0	983
Slovenia (SLO)	1997–2004	2.5	1.8	64.7	2.5	11.8	3.6	13.1	3 538	8.6	3.1	53.1	12.2	1.2	9.0	12.8	1 040
Spain (E)	1999–2004	3.5	2.6	52.7	3.9	7.1	18.4	11.8	15 269	8.3	5.4	29.4	7.6	0.9	36.9	11.5	4 887
Sweden (S)	1997–2002	16.0	0.3	39.4	5.3	17.1	4.4	17.6	5 094	42.9	0.1	25.12	12.4	0.9	7.2	11.3	2 060
Switzerland (CH)	2000–2004	13.3	0.6	27.3	3.0	33.5	9.2	13.2	4 635	37.8	0.7	19.1	10.1	3.4	14.7	13.9	2 111
United Kingdom (GB)	2001–2004	14.7	0.4	55.2	2.4	3.5	2.9	20.8	12 573	41.1	0.3	35.9	4.7	0.6	3.7	13.9	3 832

ICD-10, International Classification of Diseases, 10th revision.

[a] Source of country abbreviations except HK and PR: http://www.unece.org/trans/conventn/Distsigns.pdf

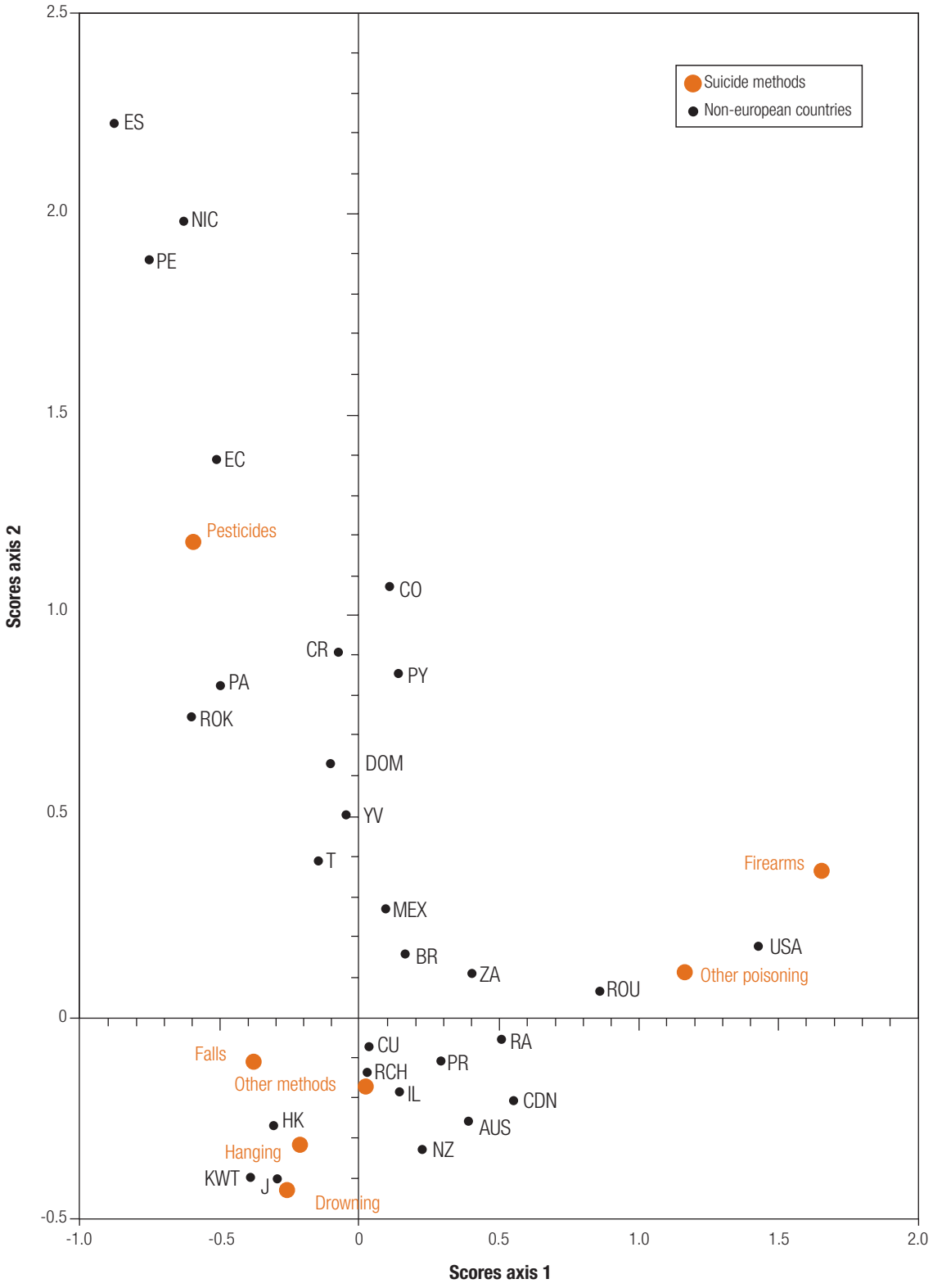
Fig. 3. **Correspondence map based on suicide frequencies, in men in the years close to 2000, for different suicide methods and non-European countries**[a]



A, Austria; AUS, Australia; BR, Brazil; CU, Cuba; CH, Switzerland; CDN, Canada; CO, Colombia; CR, Costa Rica; CZ, Czech Republic; D, Germany; DK, Denmark; DOM, Dominican Republic; E, Spain; EC, Ecuador; ES, El Salvador; EST, Estonia; F, France; FIN, Finland; GB, United Kingdom of Great Britain and Northern Ireland; GE, Georgia; H, Hungary; HK, Hong Kong Special Administrative Region, China; HR, Croatia; IL, Israel; IS, Iceland; J, Japan; KWT, Kuwait; L, Luxembourg; LT, Lithuania; LV, Latvia; M, Malta; MD, Moldova; MEX, Mexico; N, Norway; NIC, Nicaragua; NL, Netherlands; NZ, New Zealand; P, Portugal; PA, Panama; PE, Peru; PL, Poland; PR, Puerto Rico; PY, Paraguay; RA, Argentina; RCH, Chile; RO, Romania; ROK, Republic of Korea; ROU, Uruguay; S, Sweden; SK, Slovakia; SLO, Slovenia; SRB, Serbia; T, Thailand; USA, United States of America; YV, Venezuela; ZA, South Africa. Source of country abbreviations except HK and PR: http://www.unece.org/trans/conventn/Distsigns.pdf

[a] Scores on each dimension represent distances from the average method or country profile.

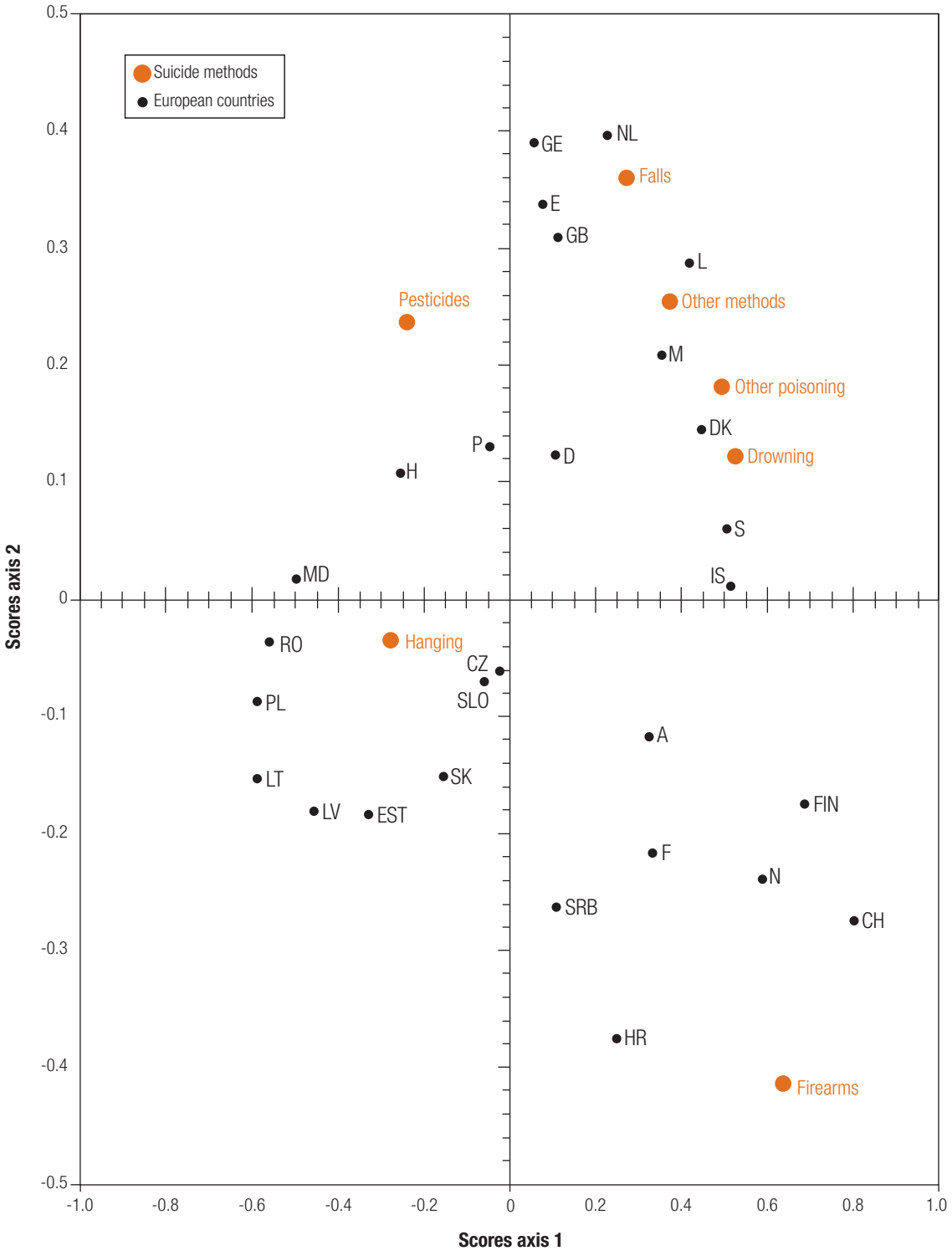
Fig. 4. **Correspondence map based on suicide frequencies, in women in the years close to 2000, for different suicide methods and non-European countries**[a]



A, Austria; AUS, Australia; BR, Brazil; CU, Cuba; CH, Switzerland; CDN, Canada; CO, Colombia; CR, Costa Rica; CZ, Czech Republic; D, Germany; DK, Denmark; DOM, Dominican Republic; E, Spain; EC, Ecuador; ES, El Salvador; EST, Estonia; F, France; FIN, Finland; GB, United Kingdom of Great Britain and Northern Ireland; GE, Georgia; H, Hungary; HK, Hong Kong Special Administrative Region, China; HR, Croatia; IL, Israel; IS, Iceland; J, Japan; KWT, Kuwait; L, Luxembourg; LT, Lithuania; LV, Latvia; M, Malta; MD, Moldova; MEX, Mexico; N, Norway; NIC, Nicaragua; NL, Netherlands; NZ, New Zealand; P, Portugal; PA, Panama; PE, Peru; PL, Poland; PR, Puerto Rico; PY, Paraguay; RA, Argentina; RCH, Chile; RO, Romania; ROK, Republic of Korea; ROU, Uruguay; S, Sweden; SK, Slovakia; SLO, Slovenia; SRB, Serbia; T, Thailand; USA, United States of America; YV, Venezuela; ZA, South Africa. Source of country abbreviations except HK and PR: http://www.unece.org/trans/conventn/Distsigns.pdf

[a] Scores on each dimension represent distances from the average method or country profile.

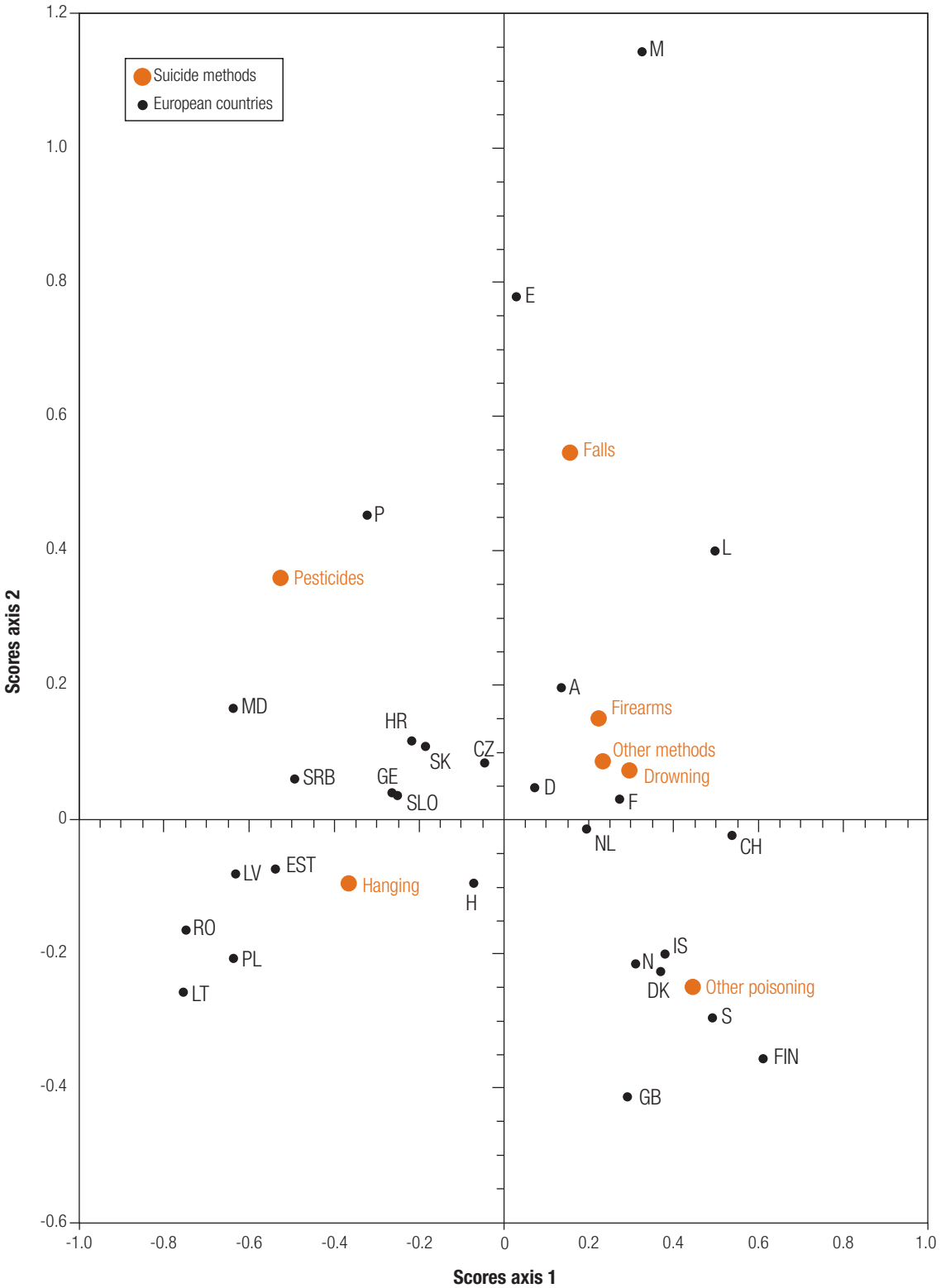
Fig. 5. **Correspondence map based on suicide frequencies, in men in the years close to 2000, for different suicide methods and European countries**[a]



A, Austria; AUS, Australia; BR, Brazil; CU, Cuba; CH, Switzerland; CDN, Canada; CO, Colombia; CR, Costa Rica; CZ, Czech Republic; D, Germany; DK, Denmark; DOM, Dominican Republic; E, Spain; EC, Ecuador; ES, El Salvador; EST, Estonia; F, France; FIN, Finland; GB, United Kingdom of Great Britain and Northern Ireland; GE, Georgia; H, Hungary; HK, Hong Kong Special Administrative Region, China; HR, Croatia; IL, Israel; IS, Iceland; J, Japan; KWT, Kuwait; L, Luxembourg; LT, Lithuania; LV, Latvia; M, Malta; MD, Moldova; MEX, Mexico; N, Norway; NIC, Nicaragua; NL, Netherlands; NZ, New Zealand; P, Portugal; PA, Panama; PE, Peru; PL, Poland; PR, Puerto Rico; PY, Paraguay; RA, Argentina; RCH, Chile; RO, Romania; ROK, Republic of Korea; ROU, Uruguay; S, Sweden; SK, Slovakia; SLO, Slovenia; SRB, Serbia; T, Thailand; USA, United States of America; YV, Venezuela; ZA, South Africa. Source of country abbreviations except HK and PR: http://www.unece.org/trans/conventn/Distsigns.pdf

[a] Scores on each dimension represent distances from the average method or country profile.

Fig. 6. **Correspondence map based on suicide frequencies, in women in the years close to 2000, for suicide methods and European countries**[a]



A, Austria; AUS, Australia; BR, Brazil; CU, Cuba; CH, Switzerland; CDN, Canada; CO, Colombia; CR, Costa Rica; CZ, Czech Republic; D, Germany; DK, Denmark; DOM, Dominican Republic; E, Spain; EC, Ecuador; ES, El Salvador; EST, Estonia; F, France; FIN, Finland; GB, United Kingdom of Great Britain and Northern Ireland; GE, Georgia; H, Hungary; HK, Hong Kong Special Administrative Region, China; HR, Croatia; IL, Israel; IS, Iceland; J, Japan; KWT, Kuwait; L, Luxembourg; LT, Lithuania; LV, Latvia; M, Malta; MD, Moldova; MEX, Mexico; N, Norway; NIC, Nicaragua; NL, Netherlands; NZ, New Zealand; P, Portugal; PA, Panama; PE, Peru; PL, Poland; PR, Puerto Rico; PY, Paraguay; RA, Argentina; RCH, Chile; RO, Romania; ROK, Republic of Korea; ROU, Uruguay; S, Sweden; SK, Slovakia; SLO, Slovenia; SRB, Serbia; T, Thailand; USA, United States of America; YV, Venezuela; ZA, South Africa. Source of country abbreviations except HK and PR: http://www.unece.org/trans/conventn/Distsigns.pdf

[a] Scores on each dimension represent distances from the average method or country profile.