Suicides in the Canton of Lucerne over 5 years: subjects with and without psychiatric history and diagnosis

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Summary

BACKGROUND: The majority of suicides had never had contact with the mental health care system. The aim of this study is to investigate the specific characteristics of this particular group.

METHODS: Coroners' files were examined for all 256 suicide victims in the Canton of Lucerne between 2002 and 2006, together with the data from the files of the public psychiatric institutions for individuals who had been registered as patients. The sociodemographic, suicidological and clinical variables of suicides who had been psychiatric patients were compared with those of other suicides. Within the latter group, suicides with remarks on their mental state in the coroner's files ("police diagnosis") were compared with suicides without such remarks.

RESULTS: Assisted suicides (24/256 [9.4%]) were excluded from the comparative analysis. 151 (65.1%) of the remaining 232 suicides had never been registered by a public psychiatric service; 40 (26.5%) of these had a "police diagnosis". In the regression analysis intoxication as a suicide method, announcement of suicide and impaired health characterised suicides with an established psychiatric diagnosis, whereas suicides without a psychiatric diagnosis were more likely to be retired. Among the latter, those without a "police diagnosis" were more likely to have left a suicide note.

CONCLUSIONS: Unexpectedly, the only difference between suicide methods with and without former contact with the mental health system was poisoning. Within the latter group, the subgroup without "police diagnosis" left more suicide notes. Further qualitative analyses of suicide notes might be useful in improving understanding of the motives of suicides without a manifest psychiatric history.

Key words: suicide; suicide and mental disorder; suicide and physical illness; suicide outside mental health care, suicide notes

Background

Suicide and mental disorder

Several comprehensive studies or meta-analyses claim that more than 90% of suicides are suffering from mental illness [1–4]. This idea has recently been challenged [5], since the method used by most of the researchers, the psychological autopsy, is not sufficiently standardised (time between suicide and interviewing of informants, number of informants, instruments used) to draw a generalised conclusion [6]. It has been suspected that "worrying" [7] or "shame" [8], which are not psychiatric conditions, are in many cases the decisive precursor of suicide. The Swiss experience focuses in particular on another cause of suicide: physical illness. During the last decade there have been some 1,300 suicides per year, a figure that has remained stable. However, the share of assisted suicide has been growing continuously, attaining almost a quarter of all suicides [9]. Even a highly critical article on the practices of one of the Swiss "right to die societies", at no point challenged the notion that the motivation for assisted suicide is in most cases a serious physical illness or disability and not a mental disorder [10]. The role of serious or lethal somatic illnesses as a motive for suicide, however, has not even been addressed in the comprehensive studies mentioned above. But even if one does not challenge the important role of mental disorder as a precursor of suicide, only a minority of suicide victims were in contact with the mental health system at the time of their suicide [11].

Suicide in Switzerland

Contrary to van Praag's assertion [7] that suicide rates have remained stable for decades, the annual rate of suicide in Switzerland reached a maximum in the early eighties and has since then declined continuously to the end of the millennium [12]. This phenomenon has also been observed in the Nordic countries [13]. In the case of Denmark, the improvement in the general quality of life has been suggested as a possible reason for this favourable development

[14], Hepp and others consider that further reasons may be restriction of access to lethal materials and improvement in general psychiatric care [12]. None of these hypotheses, however, has been empirically tested for these countries in the period since the 1980s [12, 14]. It is interesting to note that the decline in suicide numbers in the Nordic countries started before the introduction of SSRI's [13].

Rates and patterns of suicide differ considerably, not only between but also within countries [15]. For instance, suicide rates vary between cantons in Switzerland and even between urban and rural regions within cantons [16]. If one takes the number of practising psychiatrists per head of population as proxy for the quality of psychiatric care in a given region – the rate of available beds in psychiatric hospitals might be a poor indicator [17] – the conditions in some individual cantons must be excellent: 51/100,000 in Zurich and 41/100,000 in the north-western region of Switzerland. This exceeds the average in the EU (10-19/100,000) by a factor of 3 to 4 [17, 18]. Interestingly, cantons with a large number of practising psychiatrists such as Basle (northwestern Switzerland) or Zurich have a higher suicide rate than cantons with a smaller proportion of practising psychiatrists [18]. Two studies of suicides from these cantons have however shown that less than two fifths of suicide victims had ever received an official psychiatric diagnosis [16, 19]. Even assuming that some of these suicides were treated for a time by a practising psychiatrist, it is likely that in the course of their treatment they would have been referred for inpatient treatment once they showed symptoms of suicidality – either voluntarily or involuntarily, in accordance with Art. 397 a of the Swiss Civil Code (from 2013, Art. 426 Swiss Civil Code). Since there is no official register of patients treated by practising psychiatrists, it is impossible to verify how many of the suicides were exclusively treated by a practising psychiatrist. Hence it is still unclear why, in a country with excellent psychiatric facilities, fewer than 40% of all suicides have ever been seen by a public psychiatric service.

Suicides who never had contact to the mental health system might differ from former psychiatric patients with respect to residence (rural, urban), age or suicide method. For instance, in his study on suicides by weapons in Switzerland, Frei [19] found that young men without any psychiatric history and of good professional background are particularly prone to use their army weapons, which, as conscripts, they keep at home, as a means of suicide. We therefore thought it worthwhile to investigate differences between suicides with past contact to psychiatric facilities compared to suicides without such contact, with the intention of characterising the latter group.

Materials and methods

Study sample

Whenever the examining physician is in doubt about a natural cause of death, Swiss criminal procedure considers this as "an extraordinary death" (aussergewöhnlicher Todesfall) and he is obliged to inform the authorities, who then start an investigation [20]. In Canton Lucerne, it is the district attorney who then examines the case, assisted by a public

health officer, who may recommend further proceedings such as a postmortem. Suicides and all other causes of death are registered in the Swiss mortality statistics, from which age, sex, method of suicide, somatic and psychiatric diagnosis at time of death, actual place of residence and country of origin can be extracted. Specific clinical information on suicides can only be obtained at the level of the cantons, e.g. by consulting the coroners' files, which are usually kept in the local institutes of forensic medicine or offices of the district attorneys [19, 21] and – after permission has been given – cross-checking the names of the suicides in the registers of the local public psychiatric institution [19]. The region we have chosen for our investigation, Canton Lucerne, has a mixed rural-urban population. About 5% of the Swiss population live in Canton Lucerne, in which the number of practising psychiatrists is comparatively small (17/100,000) [18].

Our study was approved by the the local head district attorney and the Federal Commission for the Protection of Patients' Rights in Medical Research.

Selected variables

In Lucerne the records of all extraordinary deaths are kept in the offices of the local district attorneys. After obtaining permission from the head district attorney, we selected all records classified as suicide or probable suicide (Chapter X 60 – X 84 according to ICD-10) for the years 2002–2006. Suicide methods which were less frequent than 5% of the total were aggregated as "others". We cross-checked the data with the records kept in the archives of the cantonal
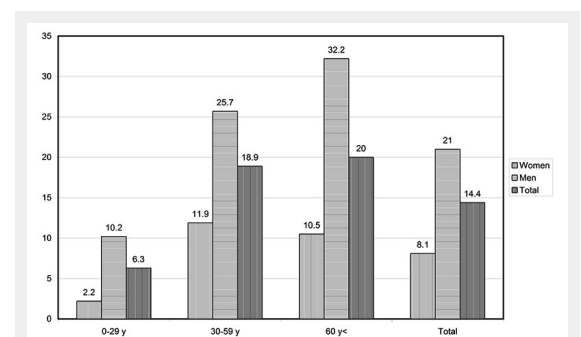

Figure 1

Suicide rate per 100,000 inhabitants and year including assisted suicide by age group and sex (n = 256).
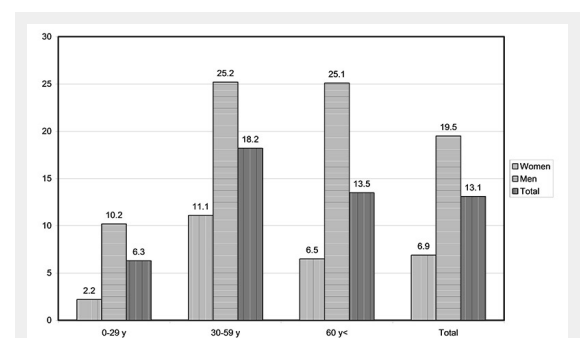

Figure 2

Suicide rate per 100,000 inhabitants and year by age group and sex, excluding assisted suicides (n = 232).

psychiatric institutions. This was done with the permission of the Federal Commission for the Protection of Patients' Rights in Medical Research. We extracted the following clusters of variables and their categories and subcategories from different disciplines:

Sociodemography: Age group, sex, profession, marital status, religion, country of origin.

Suicidology: Suicide methods, crime scene, suicide announcements, suicide notes, psychiatric history as the time lapse since the last contact with one of the respective psychiatric institutions. We analysed the data to determine whether we could identify any temporally and or locally related suicide clusters in the sense of particular buildings or bridges [22], copycat suicides in the sense of the "Werther effect" [23], homicide-suicide [24] or suicide pacts [25].

Health: Physical illness, official psychiatric diagnosis according to Chapter F 00 – 09 of ICD-10, informal remarks relating to mental health in the coroners' files, obtained either from relatives or general practitioners (so called "police diagnosis", i.e. comments like "depression", "grief", "frustration" or "addiction" which were coded by us according to Chapter F 00 – 09 of ICD-10).

We compared suicides with an established psychiatric diagnosis and suicides without an established diagnosis. Since patients whose last contact was three or more years prior to the suicide are considered to have the same suicide risk as the general population [26], such suicides were allocated to the group without psychiatric diagnosis. Hospitalised patients who committed suicide within up to 7 days after release were indicated as "acute inpatients", patients who had been seen within 30 days by a psychiatric out-patients service were indicated as "acute outpatients"

In a second step, we examined only suicides without prior contact to the official psychiatric institutions and, using the same variables compared them with cases with and without "police diagnosis".

Selection of cases

According to the new practice of the Federal Statistical Office, which excludes assisted suicides from "ordinary" suicides in the mortality register [9], we excluded assisted suicides from the comparative analysis. On the other hand, since all extraordinary deaths from an overdose of any illicit drug were, despite some ambiguity [27], considered to be suicides by the authorities, they were included in our descriptive analyses.

Statistical methods

All categorical variables were compared in bivariate analyses by the chi-square test. Each variable which yielded significant results was included in a stepwise binary logistic regression. The dependent variable was coded for suicides with and without established psychiatric diagnoses. Similarly, we selected all suicides who had no prior contact to the official psychiatric institutions and coded suicides with and without "police diagnosis" as dependent variables. Here we also included all variables with significant differences in bivariate analyses in a stepwise binary logistic regression. The calculations were performed using SPSS Version 18 [SPSS Inc., Statistical Package for Social Sciences].

Results

Between 2002 and 2006, there were 256 suicides in the canton of Lucerne, 24 or 9.4% of these being assisted suicides. The mean suicide rate over these five years of all suicides was 14.4/100,000 and 13.1/100,000 after excluding assisted suicides. The exclusion of assisted suicides had an important impact on the suicide rate related to age.

81/232 (34.9%) of the suicide victims had been registered once or several times over the last three years as patients in one of the public psychiatric institutions, while 151/232 suicides (65.1%) had not been registered. A small majority of those with an established psychiatric diagnosis, i.e. 41/81 (51%), were in contact with the psychiatric services at the time of suicide. This corresponds to 17.7% of the 232 unregistered suicides. The most frequently established diagnosis, in 31/81 patients (38%), was "affective disorder" (F3 according to ICD 10).

40/151 (26.5%) of suicides without a diagnosis established by the public psychiatric service had references relating to mental problems in their files, making it possible to establish a psychiatric diagnosis. Affective disorder ("depression") was again the most frequent diagnosis, viz. 17/40 (43%)

Among the suicides with neither an established nor a "police" diagnosis, there was only one case of "homicide-suicide" – with four additional victims. This corresponds to a rate of 0.05 cases/100,000/y. Apart from that, we could not identify any suicide "hot-spot" and found no evidence of a copy-cat suicide.
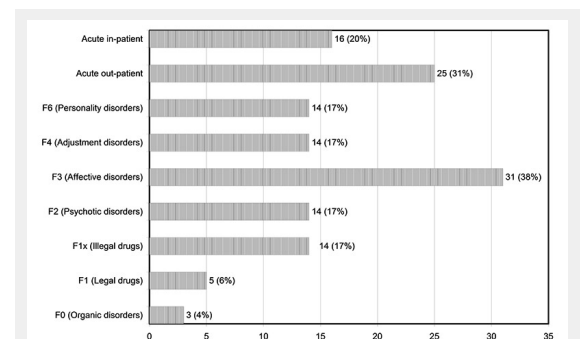

Figure 3

Psychiatric diagnoses and relevant information on suicides with psychiatric files (n = 81).
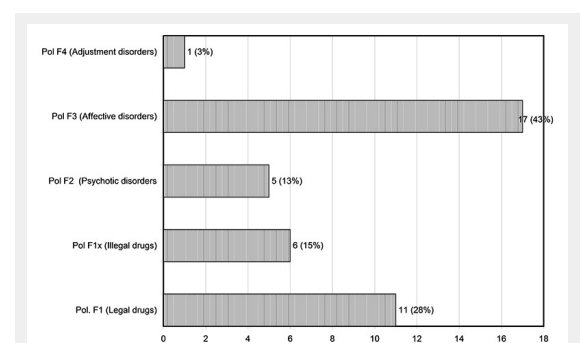

Figure 4

Psychiatric diagnoses from police files ("police diagnosis", n = 40).

Table 1 shows all variables and the cross-tabulations of the variables related to the two groups for established psychiatric diagnosis – "yes" or "no". The most frequent suicide methods – shooting, hanging and poisoning – showed almost identical frequency, but shooting was significantly more frequent among the suicides with no psychiatric dia-

Table 1: Group differences between suicides with and without an established psychiatric diagnosis.

Variable	Total sample		Former psychiatric treatment		No psychiatric diagnoses		
	N	%	N	%	N	%	p
Total	232	100	81	34.9	151	65.1	
Sociodemographic variables							
Sex							
Male	170	73.3	52	64.2	118	78.1	**0.029**
Female	62	26.7	29	35.8	33	21.9	**0.029**
Residence							
Urban	135	58.2	44	54.3	91	60.3	n. s.
Rural	97	41.8	37	45.7	60	39.7	n. s.
Civil state							
Spouse (married, common law)	80	34.5	21	25.9	59	39.1	n. s.
Single (also widowed)	152	65.5	60	74.1	92	60.9	n. s.
Nation							
Swiss	207	89.2	72	88.9	135	89.4	n. s.
Foreigner from EU	15	6.5	5	6.2	10	6.6	n. s.
Foreigner outside the EU	10	4.3	4	4.9	6	4.0	n. s.
Religion							
Catholic	132	56.9	52	64.2	80	53.0	n. s.
Protestant	24	10.3	7	8.6	17	11.3	n. s.
Other/no religion	76	32.8	22	27.2	54	35.8	n. s.
Age groups							
0–29	41	17.7	16	18.5	25	17.2	n. s.
30–59	139	59.9	59	72.8	80	53.0	**0.003**
60<	52	22.4	7	8.6	45	29.8	**<0.001**
Professions							
Disabled	32	13.8	20	24.7	12	13.9	**0.001**
Blue-collar	45	19.4	19	23.5	26	17.2	n. s.
White collar/Graduate	71	30.6	20	24.7	51	33.8	n. s.
Unemployed/Asylum Seeker	32	13.8	12	14.8	20	13.2	n. s.
Unskilled/Housewife	15	6.5	5	6.2	10	6.6	n. s.
Retired	37	15.9	5	6.2	32	21.2	**0.002**
Health							
No illness	162	69.8	47	58.0	115	76.2	**0.007**
Chronic illness	54	23.3	31	38.3	23	15.2	**<0.001**
Lethal illness	16	6.9	3	3.7	13	8.6	n. s.
Suicidological variables							
Suicide methods							
Others	48	20.7	18	22.2	30	19.9	n. s.
Total Fire weapons	55	23.7	6	**7.4**	49	**32.5**	**<0.001**
Army weapon	32	13.8	5	6.2	27	17.9	**0.016**
Private gun	23	9.9	1	1.2	22	14.6	**0.001**
Hanging	58	25.0	19	23.5	39	25.8	n. s.
Leaping	19	8.2	7	8.6	12	7.9	n. s.
Intoxication	52	22.4	31	**38.3**	21	13.9	**<0.001**
Legal drugs	30	12.9	16	19.8	14	9.3	**0.038**
Illegal drugs	22	9.5	15	18.5	7	4.6	**0.002**
Suicide note							s.
Yes	85	36.6	25	30.9	60	39.7	n. s.
No	147	63.4	56	69.1	91	60.3	n. s.
Suicide announcement							
Yes	138	59.5	71	87.7	67	44.4	**<0.001**
No	94	40.5	10	12.3	84	55.6	**<0.001**
Crime scene							
Home	137	59.1	46	56.8	91	60.3	n. s.
Public	85	36.6	34	35.8	51	37.1	n. s.
Institution	10	4.3	6	7.4	4	2.6	n. s.
n. s. = not significant							

gnosis, poisoning among those with a psychiatric diagnosis and hanging was evenly distributed among the two groups. It is noteworthy that hanging was used in only three cases (5%) as a suicide method in an institution (prison, clinic)

According to the logistic regression model (table 2), suicide victims with an established psychiatric diagnosis were more likely to have died from legal and illegal drugs (legal drugs: regression coefficient 1.519 , OR = 4.567, confidence interval 1.153–18.085, p = 0.31; illegal drugs: regression coefficient 1.436, OR = 4.204, confidence interval 1.302–13.577, p = 0.16), to have suffered from a chronic somatic illness (regression coefficient 1.158, OR=3.185, confidence interval 1.310–7.741, p = 0.011) and to have announced their suicide (regression coefficient 1.158, OR = 11.042, confidence interval 4.751–25.666, p <0.001); on the other hand, retired suicide victims were seven times more likely never to have contacted a public psychiatric service (regression coefficient –1.974, OR = 0.134, confidence interval 0.044–0.439).

Table 3 shows the cross-tabulations of the variables related to the two groups "police diagnosis" "yes" or "no". There was only one foreigner with a "police diagnosis". "Hard" or "impulsive" suicide methods like shooting or hanging were not considered by the coroner to indicate a psychiatric disorder – in contrast to intoxication with legal drugs.

According to the logistic regression model (table 4), suicide victims without a police diagnosis were about 2.6 times more likely to be male (regression coefficient –.975, OR = 0.377, confidence interval 0.145–0.979, p = 0.045) and also 2.6 times more likely to have left a suicide note (regression coefficient –.969, OR = 0.380, confidence interval 0.155–0.929, p = 0.34).

Discussion

General comments

In this study the number of suicides who had never been seen by a public psychiatric service was notably high, even slightly higher than in other studies from Switzerland [16, 19] or from Denmark [14]. Our practice of counting suicides without contact to public psychiatric mental services during the preceding three years as suicides without an established psychiatric diagnosis may explain this difference. Since our figure of suicides without an established psychiatric diagnosis is similar to that found in the region of Basle or in Canton Zurich with their much greater concentrations of practising psychiatrists, we do not think this is mainly a problem of scarce psychiatric facilities. The fact that the 41 of 80 cases (51%) with an established psychiatric diagnosis committed suicide within a very short time of the last contact to a psychiatric service (seven days for inpatients, 30 days for outpatients) is a well known phenomenon [18, 29], but is not the subject of this paper.

Our study showed similar results for the frequency of suicide methods to those found in the above-mentioned studies from other parts of Switzerland, namely the high frequency of suicide with guns [16, 19], even though our study sample was smaller. The exclusion of assisted suicide had an important impact on the distribution of suicide rates in the different age categories, since the age group with the highest suicide rate is no longer the oldest, but the intermediate age group [2, 30].

Table 2: Predictors of suicides with and without psychiatric diagnosis.					
Explanatory variables	**Regression coefficient**	**Odds-Ratio**	**95% confidence interval**		**p**
Sociodemographic variables					
Sex					
Female	1 (reference category)				
Male	−.393	.675	.299	1.523	.344
Profession					
White collar/Graduate	1 (reference category)				
Disabled	.021	1.021	.320	3.260	.972
Retired	−1.974	.139	.044	.439	**.001**
Blue-collar	.590	1.804	.688	4.729	.230
Unemployed/Asylum Seeker	.121	1.129	.387	3.295	.825
Unskilled/Housewife	−.452	.636	.146	2.765	.546
Suicidological variables					
Suicide methods					
Others	1 (reference category)				
Army weapon	−.527	.591	.166	2.100	.416
Private gun	−1.847	.158	.018	1.403	.098
Hanging	−.158	.854	.360	2.026	.721
Leaping	.523	1.686	.441	6.451	.445
Legal drugs	1.519	4.567	1.153	18.085	**.031**
Illegal drugs	1.436	4.204	1.302	13.577	**.016**
Suicide announcement					
No	1 (reference category)				
Yes	2.402	11.042	4.751	25.666	**<0.001**
Health					
No illness	1 (reference category)				
Chronic illness	1.158	3.185	1.310	7.741	**0.011**
Lethal illness	−.858	424	.125	1.435	0.168

Suicides with vs. without an established psychiatric diagnosis

Hanging, shooting and intoxication were the most frequent suicide methods. Contrary to our expectations [15], neither shooting, which might be used impulsively in critical situations, or jumping from heights, which the severely mentally ill might be expected to use [31, 32], differentiated

between the two groups after checking for sociodemographic factors or health.

The fact that suicides with a psychiatric diagnosis were more closely associated with the use of illicit or legal drugs was no surprise. This may be because users of illicit drugs have a better chance of having been registered as psychiat-

Table 3: Group differences of suicides without established psychiatric diagnosis split into with and without "police diagnosis".

Variable	Total Sample		Police diagnosis		No police diagnoses		
	N	%	N	%	N	%	p
Total	151	100	40	26.5	111	73.5	
Sociodemographic variables							
Sex							
Male	118	70.3	24	60.0	94	84.7	**<0.003**
Female	33	26.7	16	40.0	17	15.3	**0.003**
Religion							
Catholic	80	53.0	22	55.0	58	52.3	n. s.
Protestant	17	11.3	7	17.5	10	9.0	n. s.
Other/no religion	54	32.7	11	27.5	43	38.7	n. s.
Professions							
Disabled	12	7.9	7	17.5	5	4.5	**0.016**
Blue-collar	26	17.2	3	7.5	23	20.7	n. s.*
White collar/Graduate	51	33.8	13	32.5	38	34.2	n. s.
Unemployed/Asylum Seeker	20	13.5	2	5.0	18	16.2	n. s.
Unskilled/Housewife	10	6.6	7	17.5	3	2.7	**0.004**
Retired	32	21.2	8	20.0	24	21.6	n. s.
Suicidological variables							
Suicide means							
Others	30	19.9	5	12.5	25	16.1	n. s.
Total fire weapons	49	32.5	10	25.0	39	35.1	n. s.
Army weapon	27	17.9	4	10.0	23	20.7	n. s.
Private gun	22	14.6	6	15.0	16	14.4	n. s.
Hanging	39	25.8	10	25.0	29	26.1	n. s.
Leaping	12	7.9	4	10.0	8	7.9	n. s.
Intoxication	21	13.9	11	27.5	10	9.0	**0.007**
Legal drugs	14	7.2	6	15.0	8	9.3	**0.009**
Illegal drugs	7	4.6	5	12.5	2	1.8	n. s.
Suicide note							
Yes	60	39.7	9	22.5	51	45.9	**0.014**
No	91	60.3	31	77.5	60	54.1	**0.014**
Suicide announcement							
Yes	67	44.4	22	55.0	45	40.5	n. s.
No	84	55.6	18	45.0	66	59.5	n. s.
n. s. = not significant							

Table 4: Predictors of suicides without established psychiatric diagnosis.

Explanatory variables	Regression coefficient	Odds-Ratio	95% Confidence interval		p
Sociodemographic variables					
Sex					
Female	1 (reference category)				
Male	−.975	.377	.145	.979	**.045**
Profession					
White collar/Graduate	1 (reference category)				
Disabled	1.151	3.162	.805	12.417	.099
Retired	−.180	.835	.286	2.436	.741
Blue-collar	−.972	.378	.094	1.519	.170
Unemployed/Asylum Seeker	−1.274	.280	.054	1.454	.130
Unskilled/housewife	1.295	3.651	.721	18.498	.118
Suicidological variables					
Suicide note					
No	1 (reference category)				
Yes	−.969	.380	.155	.929	**.034**

ric patients, or because legal drugs were prescribed by doctors.

In our sample suicides with former contact to the psychiatric health system were three times more likely to have suffered from a chronic somatic disorder than those without former contact. Since it is a well-known fact that people suffering from a mental disorder are likely to die prematurely – not only by suicide, but from somatic illnesses [33] – this might suggest that the process which eventually led to the suicide was probably more acute than for suicides without former contact to the mental health system.

Our finding that retired persons were seven times more likely to be in the group without a registered mental health problem is somehow inconsistent with de Leos' notion of the "paradox of suicide in old age": De Leo wondered why old people who have overcome many crises in their lives should commit suicide at all when the natural end of life is close anyway [34]; according to our results, however, some still do.

The clearest difference was in suicide announcement, which might be explained by the fact that "suicidality" as such was a motive for referral to psychiatric care or treatment; it is, however, noteworthy that a large group of those without a psychiatric diagnosis also announced their suicide.

Suicides without an established psychiatric diagnosis but with a "police diagnosis" vs. suicides without a psychiatric diagnosis

Even though almost two thirds of all suicides had no established diagnosis, there were 40 cases where a putative mental disorder was noted, allowing us to hypothesise about a diagnosis. These diagnoses, however, relied on the impressions of lay people and were therefore less differentiated than diagnoses established in psychiatric institutions. The diagnosis "personality disorder", for example, was absent and alcohol related problems were more frequent. This observation is in accordance with the meta-analysis of studies on psychiatric disorders and suicide by Bertolote [35], who found that the diagnosis of suicides who had been treated in psychiatric institutions differed considerably from the diagnoses of other suicides; he actually challenged the latter's accuracy. However, we do not agree with Hoffmann-Richter's notion that the information taken from police reports of suicides is rather meaningless [36].

We have no explanation for the finding that female suicides were more likely to be given a "police diagnosis".

Suicides without any hint of a psychiatric problem were more likely to have left a suicide note than those with a remark in the files; almost half of them had an urge to communicate with posterity or to explain themselves somehow. Our finding is contrary to the general notion in the literature that there is no difference between suicides who have left a suicide note and those who have not [37, 38]. The rate of suicide notes in the whole sample was comparatively high [39, 40].

Considerations on prevention

In our sample firearms were the second most frequent suicide method. In contrast to the study of Frei [19], army weapons were more frequent than private weapons, even among former psychiatric patients. A people's initiative requesting that army weapons be no longer left to Swiss conscripts to keep at home was recently rejected by the majority of voters. Nevertheless, the authorities no longer deny the danger of misuse of army weapons, and ammunition is no longer given to conscripts to keep at home [41]. The use of private (or illegal) guns is more difficult to handle; the proposal to establish a national register was also rejected recently [41]: The only homicide-suicide in our study was committed by a farmer without a criminal record whose three weapons had been confiscated by the police four months before the event, after he had threatened his estranged wife; he committed the act with a gun obtained from an unknown source.

However, the most frequent method, hanging, was also equally distributed between *suicides with and without an established psychiatric diagnosis*. This is of concern in that this method is easy to use and besides the prevention of its use in institutions – which was rare in our study – there exist no specific strategies for prevention [42].

Limitations

In this retrospective study we chiefly used established data such as sex, age, suicide methods or the psychiatric diagnosis from medical files. We are aware that in our retrospective study the label "established psychiatric diagnosis" does not necessarily signify that a psychiatric disorder was causal or that suicides without an established diagnosis did not suffer from a mental disorder all the same. Some suicides with a mental disorder might have been treated only by a practising psychiatrist without our knowledge. As there are comparatively few practising psychiatrists in Canton Lucerne [18], it can be presumed that the number of such suicides in our study is small. We presume that some of the mentally ill who had been treated only by a practising psychiatrist or general practitioners were registered as "police diagnosis". It should also be mentioned that in his study of 100 suicides "outside the mental health care system" Owens was unable to establish a psychiatric diagnosis in 28 cases [11].

Even though our sample is small, we still consider that it is representative of the whole of Switzerland since we investigated a mixed rural/urban population. The small sample size might be of particular relevance for rare events such as homicide-suicides; the rate in our study of 0.05/100,000/y was five times smaller than that found in the Basel region [19].

This study deals with cases that occurred six to eleven years ago, so that the accuracy of its data might be open to challenge. Contrary to countries like Greece, however, Switzerland has scarcely been affected in recent years by an economic crisis, a factor which is known to contribute to a rise in suicide rates [43]. We feel that the growing acceptance of assisted suicide in the whole of Switzerland might lead to a rise in its rate; the ongoing national debate surrounding suicide by gun could have had a favourable influence on the general suicide rate in Lucerne too.

Nevertheless, we cannot suggest any factor which might have had an influence on the distribution between suicides with and without established psychiatric diagnosis.

Conclusions

The majority of suicides in the canton of Lucerne had never been in contact with an official psychiatric service and had fewer somatic health problems than those who had. About a fourth of this group, however, showed some special features which seemed noteworthy to the coroner. Suicides without any hint of a mental problem in their files were more likely to have left a suicide note than suicides with a diagnosis. Leenaars [44] asserted that suicide notes were usually written minutes before the act and were an "ultrapersonal" document, allowing an unbiased view of the suicide's feelings. Since many suicides never looked for professional help and never attracted their environment's attention, but still left a suicide note, we believe it worthwhile to analyse the contents of suicide notes and compare them, to achieve a better understanding of what motivated them.

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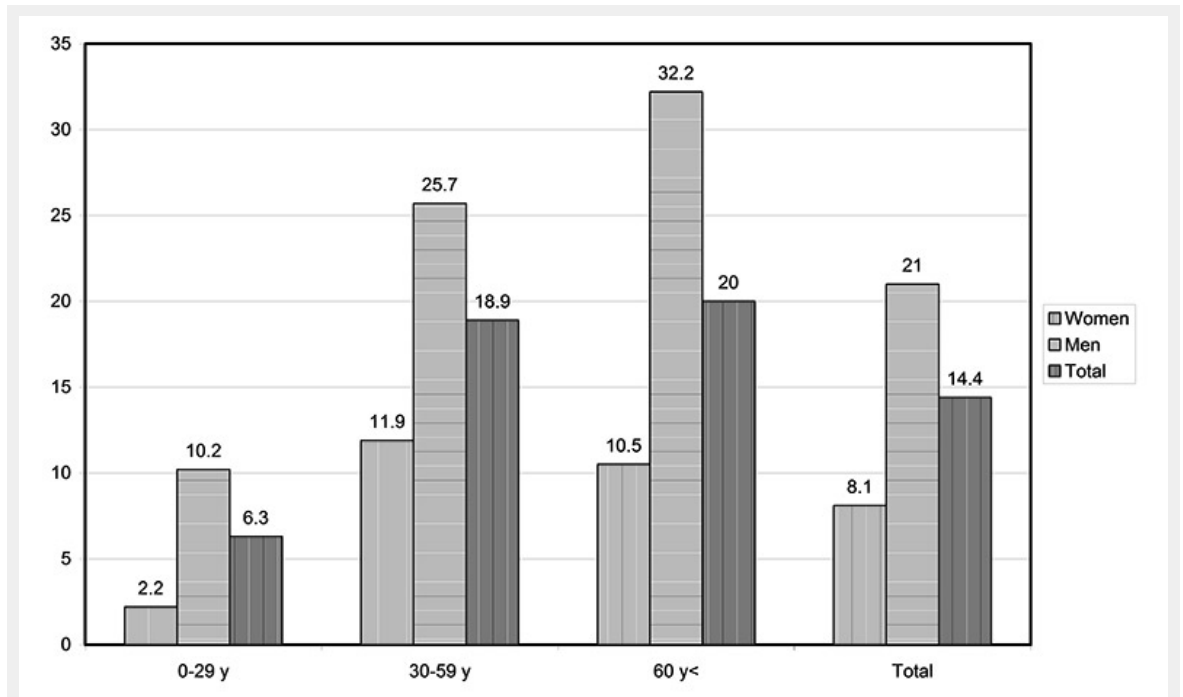
Figures (large format)

Figure 1

Suicide Rate per 100,000 Inhabitants and Year Including Assisted Suicide by Age Group and Sex (n = 256).
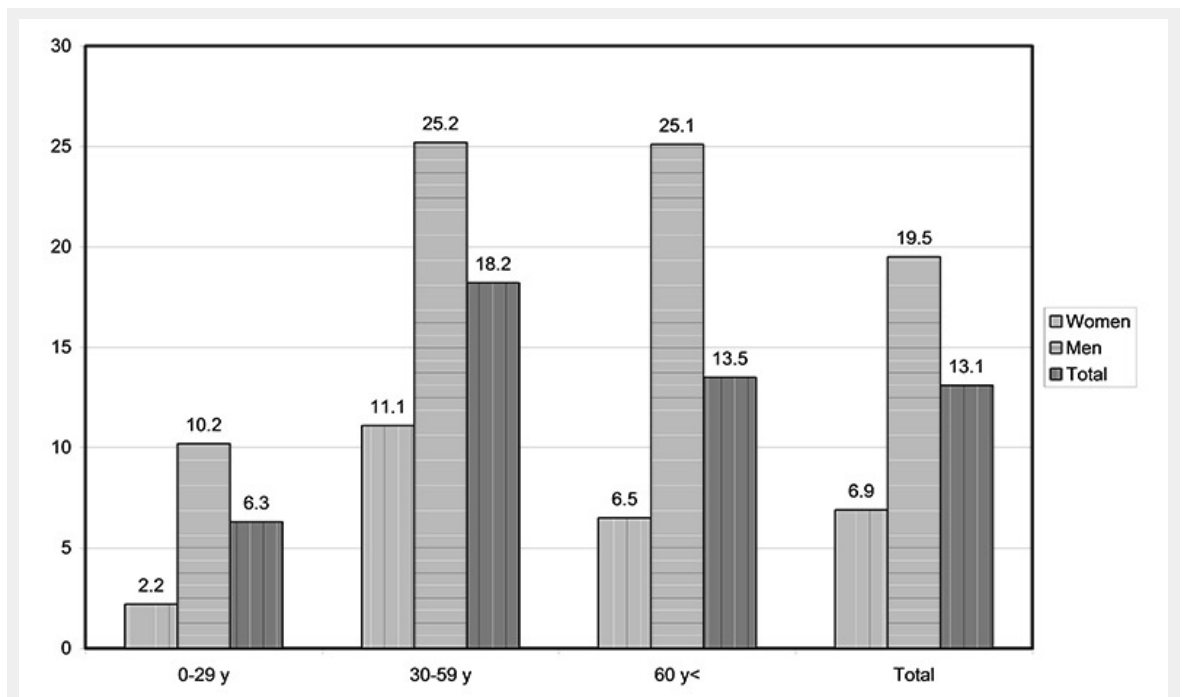

Figure 2

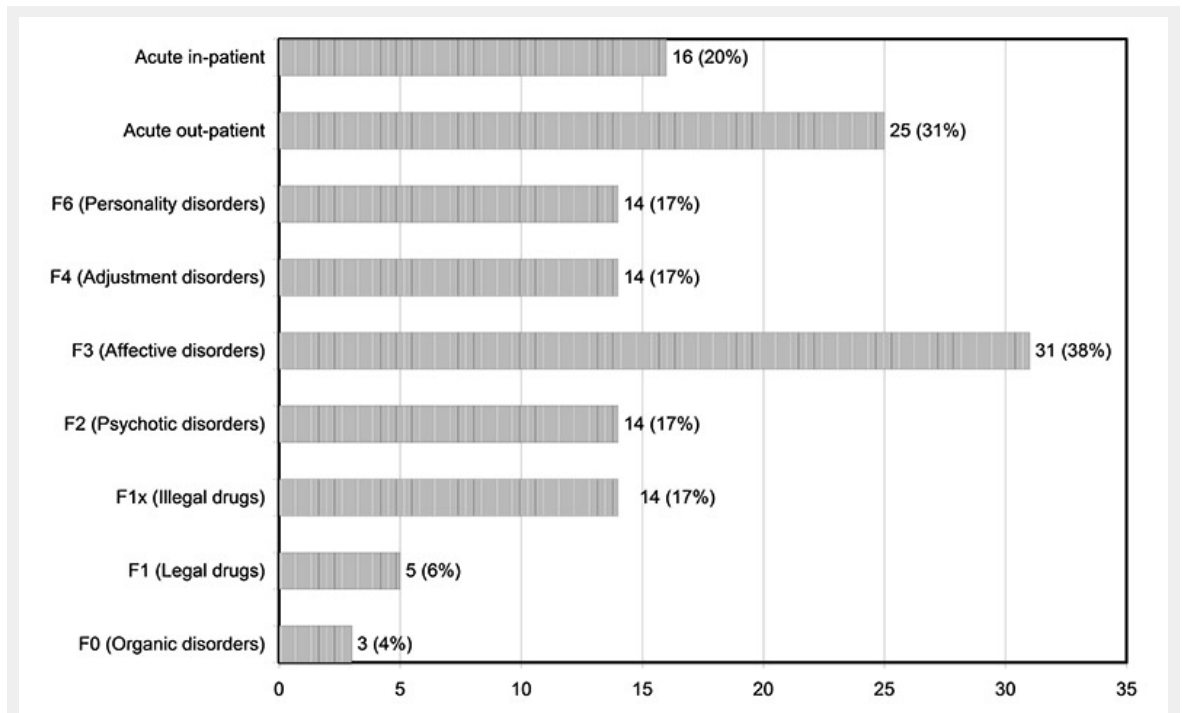Suicide Rate per 100,000 Inhabitants and Year by Age Group and Sex, Excluding Assisted Suicides (n = 232).

Figure 3

Psychiatric Diagnoses and Relevant Information on Suicides with Psychiatric Files (n = 81).
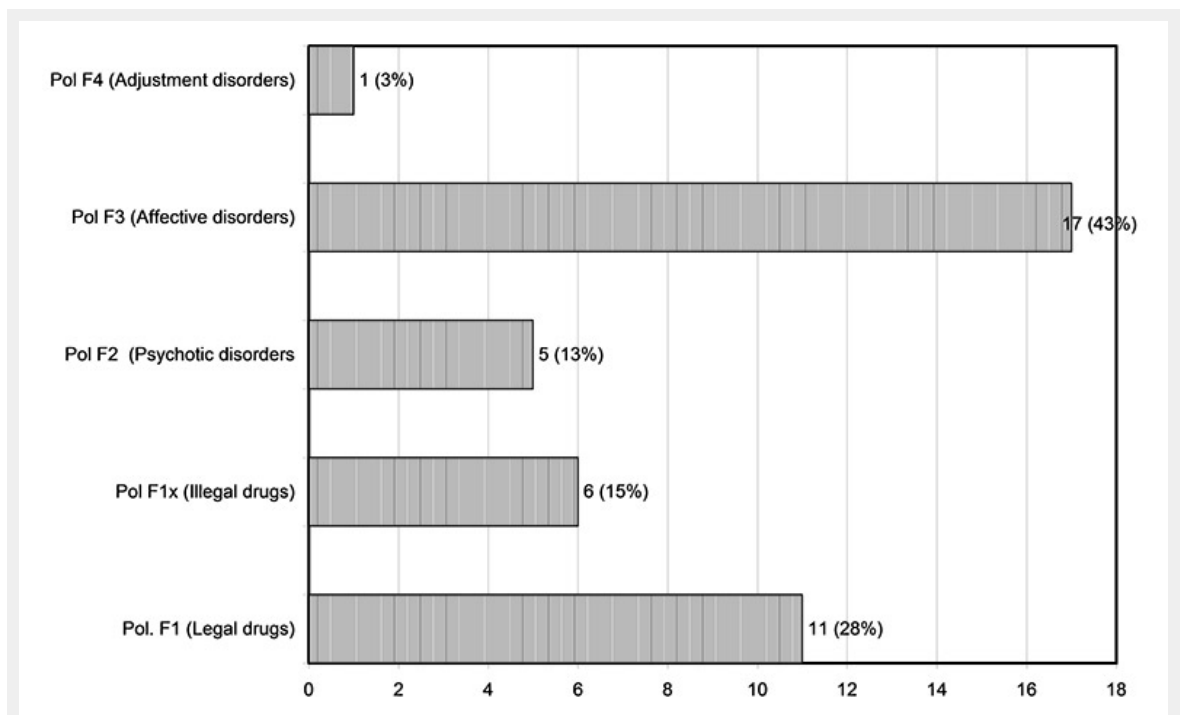

Figure 4

Psychiatric Diagnoses from Police Files ("police diagnosis", n = 40).