

Gjertsen, Finn:

Head on into the mountainside – accident or suicide?

About the reliability of suicide statistics

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On a winter's day a middle-aged driver drove straight ahead in an easy curve, plunging into the mountainside. No brake marks could be observed. The front of the car was crushed, and the deceased was pinned inside the wreck. The doctor found the cause of death to be severe injuries to the brain, and the forensic examination proved that the deceased had been under the influence of narcotics. It could not be established whether this traffic death was an accident or a suicide. Whether there was intent behind the event in such cases will be assessed on the basis of available information. In some cases it will be impossible to determine whether a death was an accident, a suicide or caused by the wilful intent of another person.

National statistics for the cause of death are used to describe variations in suicides over time and by geographical area, and the suicide rates have been an important part of epidemiological suicide research. However, do official suicide statistics provide a genuine picture of reality? There have been questions regarding the reliability of the statistics and whether they can be used to compare population groups, periods and countries (Douglas 1967, Taylor 1982, Gjertsen & Morild 1993, Tungesvik 1999). A number of studies show that there may be a number of reasons for the lack of quality in patient registers and cause-of-death statistics (Foldspang et al. 1990, Glatte & Blix 1980, Johansson et al. 1999). Below I will review the theoretical approaches to the use of official suicide statistics, a description of the data basis and the principles and rules underlying Norwegian cause-of-death statistics, and a discussion of the reliability and comparability of the statistics.

There is probably little disagreement that suicide statistics do not accurately render reality, and that some suicides are registered under other causes of death (Gjertsen 1995). In general it is assumed that official suicide figures tend to underestimate the "real" number of cases (Taylor 1982: 43-50). Estimates of the amount of under-registration vary. Even if this is an important issue, it is also important to clarify whether the sources of error are random or systematic, and whether they change over time. Statistical methods can be used to handle random errors, for example calculating confidence intervals and significance levels. Systematic errors are worse, and this source of error may be of such a nature and scope that the research value of these data is reduced to unacceptable levels.

Four ideal typical positions

In his book "Durkheim and the Study of Suicide" (1982: 43-50) Steve Taylor presents four ideal types regarding the degree of confidence researchers have in official suicide statistics. The first position is one of *general acceptance* of the use of suicide rates. This position includes researchers who use suicide rates in comparative studies of rates over time, and between countries and cultures. Such a general acceptance of official statistics builds on a number of assumptions. First there is the disagreement

between the researcher definition of suicide and the definition used for statistical purposes (validity assumption). Second this definition is applied consistently (reliability assumption), and third, registration procedures and examination methods are the same during the periods of time and populations that are studied (comparability assumption).

Analyses that follow the Émile Durkheim tradition assume that suicide rates are valid, reliable and interculturably comparable. However, questions may be raised as to the reliability or accuracy of the statistics, and some doubt will therefore be raised as to whether the official suicide statistics are a viable indicator of the "real" rate. Two sets of arguments dominate this doubt. Steve Taylor has called the first one a *position of limited acceptance*. The argument is that suicide rates are useful as a rough measure of suicide acts, but they are not reliable for an intercultural comparative analysis. Taylor (1982) claims this position dominates among researchers in this field, referring to Farberow and Stengel among others. From this position it is argued that improved registration procedures may raise data quality. The *position of scepticism to suicide rates*, conversely, doubts the value of analyses based on suicide rates due to the poor reliability of the statistics. There is also doubt as to whether the validity is tenable, even within the same country/culture over a brief period of time. This position has essentially been represented by psychiatrists and doctors. On the basis of clinical experience they have pointed out how the discrepancies between the Coroner's evidence requirements for determining whether a death is a suicide and the assessments of cause of death undertaken by medical hospitals are large enough to render suicide rates unsuitable for research purposes. Ruth Ettlinger has, for example, argued that registered suicides are heavily selected, and that differences emerging from comparative analyses essentially reflect registration differences (Taylor 1982:47).

The fourth position Taylor describes is called *rejection of official rates* as an expression of the suicide phenomenon. This position can be connected to phenomenology and ethnomethodology, where it is argued on a basis of principle how difficult/impossible it is to compile official rates about an act of deviation such as suicide.

Taylor has described positions that may help clarify variation in the use of suicide rates in analytical activities. Below is a description of the processes that form the basis of suicide statistics in Norway.

Registration of cause of death

Statistics Norway has been responsible for drawing up official cause-of-death statistics since 1925. Starting in 1939 Statistics Norway also assumed the responsibility for classifying cause of death for use in cause-of-death statistics, which previously had been in the hands of public medical officers. This change was an improvement on quality as the material was now handled far more uniformly (Gjertsen 2000).

As a member of the World Health Organization, Norway has undertaken to draw up cause-of-death statistics in accordance with the international disease classification (ICD) in effect from 1951. In practice this obligation means that information about

cause of death will be given in a standardized format, cf. fields I and II on the medical certificate of death. Moreover, the statistics must be prepared in accordance with the ICD's principles and guidelines for classification and coding of cause of death.

Section I of the death certificate is used to state conditions that may be related to the chain of events that directly led to the death. Section II is intended for other significant conditions that contributed to death, but which did not have a direct causal relationship to the disease or condition that caused the death. The World Health Organization introduced the principle of coding of the *underlying cause of death* in revision six of the ICD. The purpose of this principle was to improve comparability of cause-of-death statistics. The cause of death selected as the underlying cause of death is used in international cause-specific mortality statistics. By underlying cause of death is meant:

- a) the disease or injury that initiated the chain of unhealthy conditions that led to death, or
- b) the external circumstances of the accident or act of violence that was the cause of the lethal injury.

Classification and coding of external causes of death are necessarily fraught with uncertainty. This uncertainty may be due in part to incomplete access to information about external circumstances, and to the fact that determining external circumstances is based on discretionary judgement (Gjertsen 1992). The former is the case when the death certificate is lacking in or provides incomplete information. The discretionary judgement applied will vary. In some cases there will be little doubt as to what happened. In other cases judging the cause of death might become more a case of guesswork when determining whether the death was an accident, a suicide or murder. In cases of major doubt as to whether the death was an accident or suicide, more information will not necessarily mean that classification will be any easier, as the basis of the uncertainty is the unclear motives and thoughts of the individual.

Uncertain purpose

Revision 10 of the international disease classification divides external causes of injuries and death into the following main groups (ICD-10 1992):

- Accidents, V01-X59.
- Suicide and self-inflicted injury, X60-X84.
- Violence and assault, X85-Y09.
- Unclear whether injury was wilfully inflicted, Y10-Y34.
- Legal intervention and act of war, Y35-Y36.
- Complication arising from medical treatment or surgery, Y40-Y84.
- After-effects after external cause of disease or death, Y85-Y89.

The category "Unclear whether injury was wilfully inflicted" is used in those cases where a medical or legal examination has proved it impossible to distinguish between an accident, suicide or murder. After the introduction of this category in revision 8 of the ICD, the practice has varied between the Nordic countries when it comes to using the group "Uncertain external cause". Norway has coded few cases in this category in contrast to Sweden. Thus care must be taken when comparing accident and suicide

statistics (Health Statistics in the Nordic Countries 1997:123-136). Findings from a study of comparability of European cause-of-death statistics show some substantial differences in the use of the category mentioned (Comparability and Quality Improvement in European Causes of Death Statistics 1999). The ratio for rates for the causes "Uncertain external reason" and "Suicide" for men in 1994 varied between 1.16 (Portugal) and 0.02 (Greece). This means that in Portugal the rate for deaths by unknown external causes was higher than the suicide rate. Other countries with high ratios among men in 1994 included Great Britain (0.43), Sweden (0.31), Denmark (0.23) and France (0.21). In comparison the ratio in Norway was only 0.05.

Let us examine three examples of how information about deaths by injury may be submitted on the Medical certificate regarding death/notification of death by unnatural cause:

Example 1

I a Head, breast and abdominal injuries

Information elsewhere on the death certificate: Head-on collision with truck.

Example 2

I a Drowning?

Example 3

I a Poisoning through medication?

Comment: Assume that there was also a forensic autopsy in these three cases, and that the reports state that an external cause of injury/poisoning could not be determined. The code used for the underlying cause of death will in the above-mentioned cases belong in the category "uncertain whether the injury was an accident or wilfully inflicted".

Basis

Cause-of-death statistics are drawn up on the basis of information submitted on the Medical certificate regarding death/notification of death by unnatural causes or Notification of death from the police to the public medical officer). Furthermore, additional information is collected from the Cancer Register (cancer deaths), Medical Birth Register (stillborn and died during first year), Statistics Norway's overview of traffic accidents, autopsy findings from hospitals and forensic laboratories. In cooperation with a medical consultant additional information is also collected from the doctor/hospital when the information about cause of death and external cause of injury is incomplete or unclear. Obtaining additional information and querying the doctor/hospital is essential to ensure the quality of the statistics. Moreover, civil information (for example domicile) is obtained from the National Population Register of the Taxation Directorate which builds on information in the local population registers.

Drop in the suicide rate – poor registration?

From the end of the 1960s until the end of the 1980s the frequency of suicide increased in Norway, with a particular strong rise among young men. Thereafter official suicide statistics show a considerable downturn (30%) during the 1988-1996 period (Causes of death 1996). Giertsen and Morild (1993), forensic medical officers, have argued that much of the registered increase may be explained through improved registration procedures, while Tungesvik (1999) strongly doubts that the decline in the rate of suicide in the 1990s reflects reality, referring to his own and other clinical experiences. If we go back a few decades in time, a widespread understanding was that Norway in large part had a much lower suicide mortality rate compared to Denmark and Sweden because of poor registration.

Can the increase in suicides in the 1980s be explained by improved registration procedures, and have these procedures been weakened in the 1990s with the consequences that the number of registered suicides has dropped? For some time now Statistics Norway has had procedures for obtaining additional information when there has been inadequate or lacking information about external causes of lethal injury. Such return inquiries to the issuer of a death certificate are recommended by the World Health Organization and are carried out to a varying degree in member countries. A study assessing the importance of this return inquiry in Norway showed that it caused the number of suicides to increase by 20% (Glattre & Blix 1980). Nonetheless, such procedures may not eliminate the feeling of uncertainty that is associated with the suicide figures. The decisive factor is nevertheless whether this uncertainty has changed during recent decades.

Bearing in mind the observed increase in suicides in the Nordic countries and other European countries since the end of the 1960s, the Nordic Cooperation Committee for medical research (NOS-M) in 1977 decided to establish a Nordic research group on suicide (Juel-Nielsen & Retterstøl 1982). A sub-project consisted of a review and analysis of registration practices, principles and procedures in the reporting and registration systems in each Nordic country. This was done with the particular aim of ascertaining whether the strikingly low suicide rate in Norway compared to the levels in Finland, Sweden and Denmark was due to differences in registration practices or whether it was caused by genuine differences. The conclusion from this section of the study was that suicide registration had the same degree of reliability in all the four countries, and that Norwegian suicide statistics were found to be at least as accurate and reliable as those in Finland, Sweden and Denmark (Juel-Nielsen et al. 1987).

Two studies estimate that the level of under-registration of suicides in Norway is less than 10%. Forensic medical experts, Giertsen and Morild (1993), estimate that doubtful figures at the end of the 1980s may have been as low as between 5 and 10 percent, but that this was considerably higher during the 1960s, perhaps approximately 25 percent. A study of the reliability of suicide statistics based on empirical material from 1978-81 concluded that there is little reason to suspect official under-registration of suicides (Ekeberg et al. 1985). If borderline cases are included, the authors estimate that under-registration is below 10 percent.

The change in suicide rates that has been observed in Norway in recent decades can scarcely be ascribed to changes in the data base, i.e. the regulations and guidelines for coding causes of death. Little is known whether other sources of error impact these figures, such as doctors, forensic experts, the police and others evaluating external causes of deaths changing their attitudes to suicide. Thus it appears reasonable to conclude that changes in suicide rates in Norway in recent decades reflect genuine changes, while also demonstrating that international comparisons must be made with caution.

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