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# Persons with Severe Mental Disorders: Life Expectancy is Greatly Reduced and Premature Mortality has Quadrupled

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**The mortality of individuals with severe mental disorders had only ever been studied in a fragmentary way in France. The availability of data relating to the medical causes of death linked with healthcare consumption data in the National Health Data System (Système National des Données de Santé, or SNDS) has enabled the study of such mortality on a national scale among the main beneficiaries of the French National Health Insurance (NHI).**

**The reduction in life expectancy for individuals with mental disorders is on average 16 years for men and 13 years for women, with variations in this figure depending on the disorders. These individuals have a mortality rate that is two to five times higher than those of the general population, whatever the cause of death, and a quadruple incidence of premature mortality. These initial findings could be complemented by studies focused on explaining this excess mortality. Concurrently, our results support the implementation of targeted initiatives to reduce the health inequalities experienced by persons with a mental disorder.**

The fact that individuals with severe mental disorders have a lower life expectancy has been known for several decades (Newman et al., 1991). Research conducted outside France has pointed to the persistence, and even the aggravation, of the difference between the life expectancy of the general population and that of individuals with long-term mental disorders, including in developed countries whose health systems are considered to be fair and efficient. The reduction in life expectancy of persons suffering from severe mental disorders was estimated to be 20 years for men and 15 years for women, while their mortality rate was two to three times higher than that of the general population (Thornicroft, 2011; Wahlbeck et al., 2011).

## What are the determinants of the excess mortality of persons with mental disorders?

In contrast with somatic diseases, mental disorders do not have direct potentially lethal organic consequences. Several hypotheses on the main determinants

of the excess mortality of persons with mental disorders have been put forward in international literature. They are not restricted to a higher risk of suicide and violent or accidental death. They also include the increased presence of risk factors for many chronic diseases, particularly behavioural disorders, such as a high consumption of tobacco, sedentary behaviour, and less compliance with treatment (Berg et al., 2013; DiMatteo et al., 2000). Persons living with a severe and persistent mental disorder are also exposed to the side effects of psychotropic drugs (Mitchell et al., 2013). Lastly, international data has shown that somatic care is less effective than those of the general population throughout the person's lifespan, particularly in terms of access to healthcare, screening, and the quality of healthcare provided (Thornicroft, 2011; Wahlbeck et al., 2011). The findings relating to the excess mortality of individuals with severe mental disorders are even more striking as they are largely linked to factors that can be acted upon, in the short term, by preventive initiatives aimed at these individuals or via a healthcare supply that is better adapted to their needs.

In France, few studies have explored this issue despite the international significance of the matter and the fact that it may be an indicator of the inefficiency of prevention policies and care of individuals suffering from mental disorders. In fact, most of the existing research relates to specific sub-populations or restricted geographical areas (Charrel et al., 2015; Lemogne et al., 2013). The only currently available national study that includes a broad spectrum of mental disorders focused on the mortality of persons identified as having a mental disorder via an analysis of the multiple causes of death extracted from death certificates between 2000 and 2013. It highlighted the reduction in life expectancy associated with certain mental disorders and objectified the importance of somatic causes, particularly cardiovascular diseases and cancers, in the deaths of persons suffering from these disorders (Ha et al. 2017).

## Context

This study was conducted in collaboration with the National Health Insurance Fund (Caisse Nationale de l'Assurance Maladie, CNAM) as part of the Mental Health section of its annual report ( "Améliorer la qualité du système de santé et maîtriser les dépenses : les propositions de l'Assurance maladie pour 2019", CNAM, 2018). Hence, it benefitted from the methodological support of Panayotis Constantinou, Thomas Lesuffleur, and Christelle Gastaldi-Ménager. It also benefitted from the statistical support of David Lapalus and Steve Nauleau from the Agence Régionale de Santé de la Région Provence – Alpes – Côte d'Azur. Lastly, it is part of IRDES's ongoing research into the care of persons with mental disorders, and is a preliminary step in the analysis of the impact of the care delivery process on mortality.

## Source

### The identification of persons with mental disorders

This study used the data provided by the National Health Data System (SNDS), which includes the hospital data from the Technical Agency for Information on Hospital Care (ATIH), all the reimbursements of hospital and community-based healthcare of the beneficiaries of the National Health Insurance Fund (CNAM), as well as some of their individual characteristics, particularly socio-demographic and medical characteristics. The SNDS also includes a medical cartography of the beneficiaries of the French Statutory Health Insurance Scheme (Régime Général) and the sub-schemes (SLM), according to certain pathologies, conditions, or frequent, serious, or costly treatments. Of these beneficiaries, 13 non-exhaustive categories of pathologies were created, one of which was related to mental disorders. The algorithms that define these categories of pathology are based on the causes of hospitalisation, long-term conditions (Affections de Longue Durée, ALD), and the prescription of drugs or medical procedures that are tracers because they are specific to the treatment of certain diseases, over a period that sometimes extended to five years (CNAM, 2018). Detailed categories were established by the CNAM within the category of mental disorders: psychotic, neurotic, and mood disorders (manic and bipolar disorders, depressive disorders, and neurotic disorders), mental deficiencies, addiction disorders, mental disorders that began in childhood, and other mental disorders.

### Mortality and causes of death

At the end of 2017, the National Health Data System (SNDS) was complemented by data relating to the medical causes of death for the years 2013 and 2014 and will eventually include all data recorded since 2006. The data includes information about the date and place of death and its causes (initial and associated), as well as the date of birth and the place of residence of the deceased person. The causes of the death are identified by a doctor during the completion of the death certificate, which is then sent to the Epidemiological Center of Medical Causes of Death for the medical causes of death (CépiDc) in the National Institute of Health and Medical Research (INSERM) and at the National Institute of Statistics and Economic Studies (INSEE). The CépiDc is responsible for coding the causes of death according to the International Classification of Diseases, tenth version, ICD-10) and determines the initial cause of death, the cause at the origin of the process of morbidity that led to the death—while the National Institute of Statistics and Economic Studies (INSEE) links the death certificate to socio-demographic information. This data is then sent to the CNAM and linked with other data from the National Health Data System (SNDS) using an indirect data linkage method that combines the year, the month, and the day of death, the gender, the year of birth, the month of birth, the county (*département*) in which the person lived, the place of residence (zip code) and, when it existed, the county of the hospital in which the patient died. The data linkage is initially carried out with all these variables, then, when no correspondence is found, with all the criteria except one, with the exception of the year of death, which must always coincide.

Nevertheless, solely relying on the causes of death to assess the prevalence of mental disorders amongst the persons who died tends to underestimate this prevalence. The capacity of death certificates to take into account mental comorbidities throughout life is indeed limited. For most of the deaths declared for persons with mental disorders, the doctor completing the death certificate does not declare the associated mental disorder in question that contributed to the process of morbidity. The doctor completing the death certificate is not necessarily the doctor who treated the individual previously. In addition, the presence of a mental disorder in the deceased individuals may also not be mentioned if the death has not been identified as connected with this disorder. The recent availability of data relating to the medical causes of death which can be linked with the data of healthcare consumption reimbursed by the French National Health Insurance (NHI) in the National Health Data System (Système National des Données de Santé or SNDS) complements the first round of French data relating to the mortality of individuals with mental disorders (see the "Source" Inset). The result is a more exhaustive identification of these individuals in comparison with the rest of the population.

In this context, this study aims to provide insight into the mortality of persons with mental disorders in France, in 2014, based on data from the National Health Data System (SNDS). This data makes it possible to compile a complete set of complementary indicators currently used in mortality studies, in comparison with the population of the principal beneficiaries of the French Statutory Health Insurance Scheme (Régime Général) and the sub-schemes (Sections Locales Mutualistes, or SLM).

In 2014, 2 million beneficiaries of the French Statutory Health Insurance Scheme (Régime Général) and the sub-schemes (SLM) who benefitted from healthcare were treated for a mental disorder. Of these, 2.7% died that year, compared with 0.7% of the beneficiaries of the French Statutory Health Insurance Scheme (Régime Général) and the sub-schemes (SLM). The causes of death of these individuals were linked with their healthcare consumption data for 54,681 deaths (98.2% of the cases). The numbers and crude death rates per type of diagnosis are set out in detail in Table 1.

**T1**

**Number and crude death rates in 2014, according to the pathological groups treated**

| *The CNAM's medical cartography (version G5)* | Number of individuals | Number of deaths in 2014 | Incidence of death (for 1,000) |
|---|---|---|---|
| Mental disorders (combined) | 2,013,094 | 54,681 | 27.2 |
| Psychotic disorders | 401,726 | 7,486 | 18.6 |
| Neurotic and mood-related disorders, including: | 1,154,683 | 37,697 | 32.6 |
| *Manic and bipolar disorders* | *192,893* | *3,535* | *18.3* |
| *Depression and other mood-related disorders* | *741,829* | *23,534* | *31.7* |
| *Neurotic disorders linked to stress and somatoform disorders* | *437,286* | *16,617* | *38.0* |
| Addiction disorders | 293,754 | 7,248 | 24.7 |
| Other mental disorders | 394,407 | 9,779 | 24.8 |
| All of the beneficiaries of the French Social Security System (Régime Général) and the sub-schemes (SLM)* | 56,518,758 | 387,332 | 6.9 |

* SLM : Sections locales mutualistes.

**Scope:** Beneficiaries of the French Statutory Health Insurance Scheme (Régime Général) and the sub-schemes (SLM) of the French Statutory Health Insurance Scheme who had consumed healthcare, for the whole of France.
**Source:** National Health Data System (SNDS). Download the data

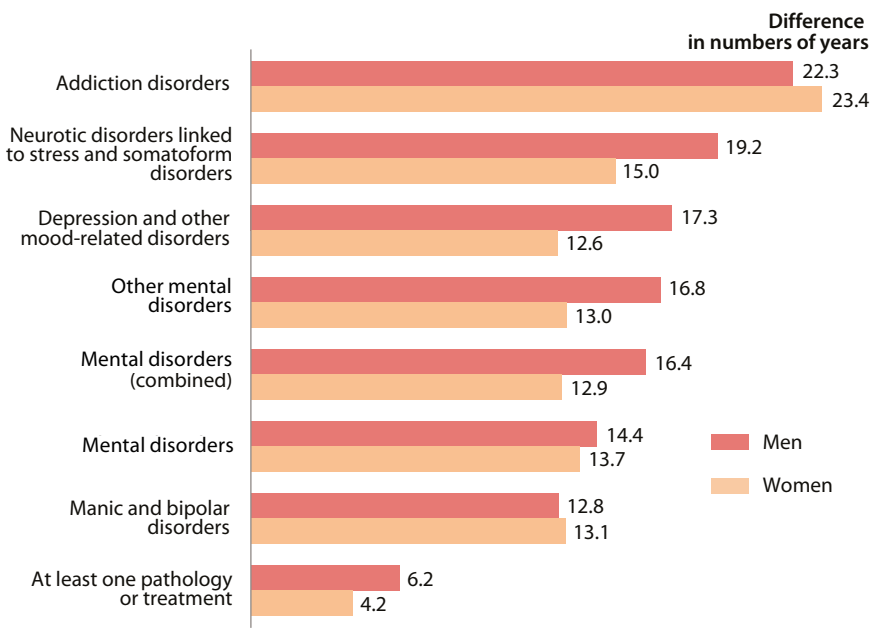
## A much reduced life expectancy at age 15, with variabilities that depend on the disorders

Life expectancy at age 15 for persons with a mental disorder, all pathologies combined, was 48.9 years for men and 58.6 years for women. Hence, at age 15, these individuals have a life expectancy that is reduced by 16.4 years for men and 12.9 years for women compared with other beneficiaries of the French Statutory Health Insurance Scheme (Régime Général) and the sub-schemes (SLM). This reduction is three times higher than that observed among beneficiaries who had at least one pathology or treatment in 2014, whether that treatment was somatic or psychiatric.

This difference was particularly evident in relation to addiction disorders (22.3 years for men and 23.4 years for women). Nevertheless, the reduction in life expectancy at age 15 is also considerable for all of the other mental disorders considered, including those with the least reduction: 12.8 years for manic and bipolar disorders amongst men and 12.6 years for depressions and other mood-related disorders amongst women (see Graph 1).

**G1**

**The difference in life expectancy at age 15 between individuals with a mental disorder and the beneficiaries of the French Statutory Health Insurance Scheme (Régime Général) and the sub-schemes (SLM), according to gender and diagnosis**



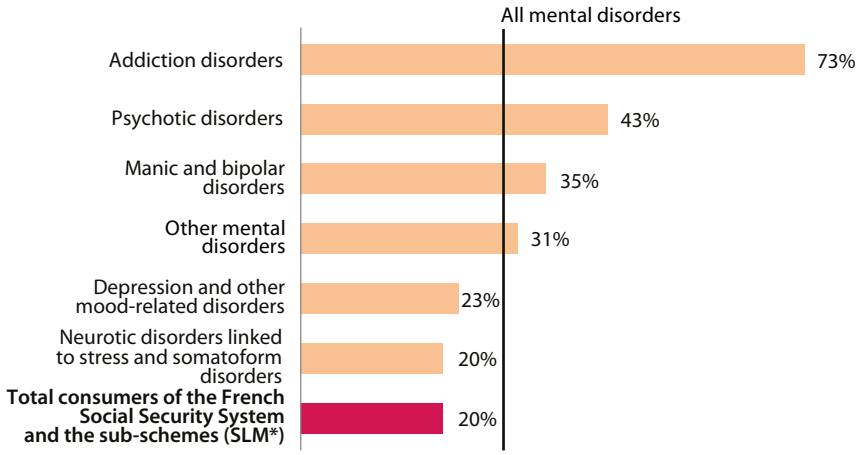

**Scope:** Beneficiaries of the French Statutory Health Insurance Scheme (Régime Général) and the sub-schemes (SLM) of the French Statutory Health Insurance Scheme who had consumed healthcare, for the whole of France.
**Source:** National Health Data System (SNDS). Download the data

## The principal causes of death are similar to those of the beneficiaries of State Health Insurance, with, nevertheless, a higher incidence of unnatural death (suicides, etc.)

Cancer and cardiovascular diseases were the two primary causes of death of persons with mental disorders (26% and 20% of the deaths respectively), just as it was for the total population of beneficiaries of the French Statutory Health Insurance Scheme (Régime Général) and the sub-schemes (SLM) who had benefitted from healthcare, even if the proportions of the deaths due to these

G2

**Percentage of premature deaths (before the age of 65) among deaths in 2014, according to the diagnosis groups treated**




* SLM : Sections locales mutualistes.

**Scope:** Beneficiaries of the French Statutory Health Insurance Scheme (Régime Général) and the sub-schemes (SLM) of the French Statutory Health Insurance Scheme who had consumed healthcare, for the whole of France.

**Source:** National Health Data System (SNDS). Download the data

causes were higher (33% for cancer and 24% for cardiovascular diseases).

Nevertheless, death due to external causes (suicides, transportation accidents, and falls) constituted the third cause of the deaths of individuals with mental disorders (10% of the deaths) and was only the fifth cause amongst the population of beneficiaries of the French Statutory Health Insurance Scheme (Régime Général) who consumed healthcare (after poorly defined morbid conditions and diseases of the respiratory system). Of the external causes, suicide represented 40% of the causes of death among persons with mental disorders (57% among persons treated for bipolar disorders), compared with 25% for all of the beneficiaries of the French Statutory Health Insurance Scheme (Régime Général) and the sub-schemes (SLM) who had received healthcare, amongst whom transportation accidents and falls constituted a significant share.

## Mortality marked by a high proportion of premature deaths

There was a high proportion of premature deaths among individuals with mental disorders, occurring before the age of 65: 28% of the deaths in this population compared with 20% amongst beneficiaries of the French Statutory Health Insurance Scheme (Régime Général) and the sub-schemes (SLM). Premature mortality was particularly high among individuals with disorders arising from the use of psychoactive substances, which represented 73% of the deaths, among persons with mental disorders, accounting for 43% of the deaths, and for manic and bipolar disorders, representing 35% of the deaths (see Graph 2).

## Excess mortality compared with the total population for all causes of death

After standardising mortality rates, persons with mental disorders had a mortality rate 2.6 times higher than that of the beneficiaries of the French Statutory Health Insurance Scheme (Régime Général) and the sub-schemes (SLM). This excess mortality was significant for all of the mental disorders considered, but was particularly evident in psychotic and addiction disor-

# METHOD

### Scope of the study

The study focused on deaths that occurred in 2014 linked with version G5 (the latest available version) of the cartography of pathologies and expenses of the beneficiaries of the French Statutory Health Insurance Scheme (Régime Général) and the sub-schemes (SLM) of the National Health Insurance Fund (CNAM). This version of the cartography includes healthcare consumption for the year 2014 (and eventually several years of records, depending on the algorithms used). The study population was therefore not representative of the entire French population: it did not include persons whose deaths could not be linked with the cartography of either the beneficiaries of schemes other than the French Statutory Health Insurance Scheme (Régime Général) and the sub-schemes (SLM) or beneficiaries who had not received treatments. The study population was therefore likely to be younger than the general French population because it did not include the beneficiaries of the Mutualité Sociale Agricole (MSA) or the Scheme for the Self-Employed (formerly the RSI), who are generally older. Furthermore, hospital deaths are overrepresented, because they can be more easily linked with healthcare consumption data, while deaths that are not linked are likely to correspond to specific populations (foreign persons, transient people, and homeless persons who had not received healthcare). Nevertheless, in contrast with most of the studies of mortality of persons with mental disorders conducted abroad, which focus either on primary care or secondary care, the use of the CNAM cartography can identify individuals with these disorders both by self-employed health professionals and in hospitals. With regard to deaths that occurred in 2014, 90% of those recorded by the Epidemiological Center of Medical Causes of Death (CépiDC) were linked with individuals whose data was present in the National Health Data System (SNDS). The death rate was 98% for those individuals in the cartography of the beneficiaries of the French Statutory Health Insurance Scheme (Régime Général) and the sub-schemes (SLM) included in the category of mental disorders.

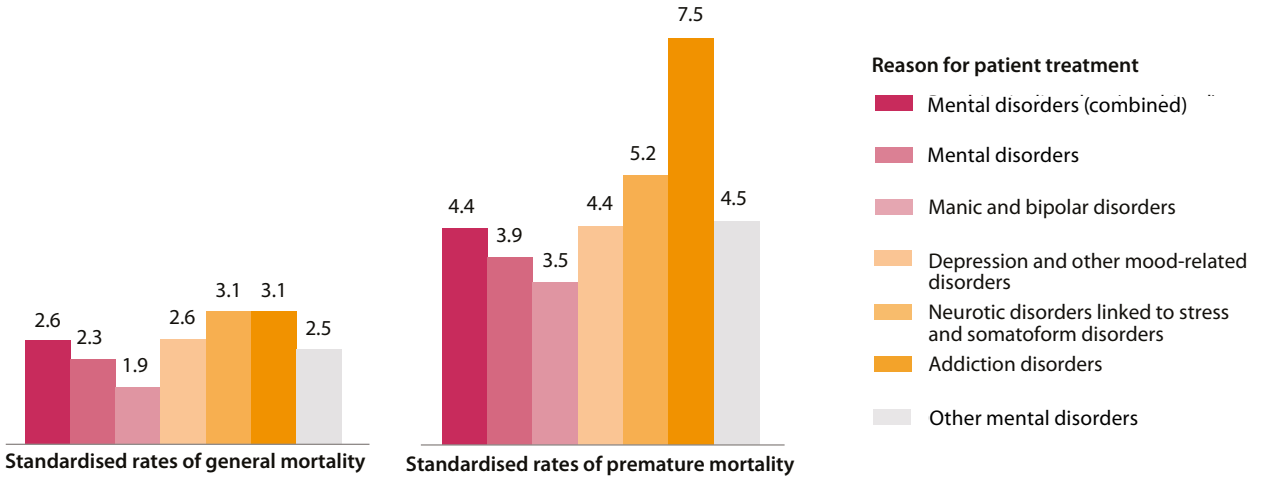
This category in the cartography includes all of the disorders in chapter V relating to "Mental and behavioural disorders" ('Troubles mentaux et du comportement') of the ICD-10, with the exception of dementia (F00 to F03) and other behavioural disorders, and other emotional disorders that habitually appear in childhood or adolescence (F98). Incidentally, mental disorders that emerge during childhood (incorporating mental development disorders F8 and F90 to F94) and mental deficiencies were not included in the analysis per pathology due to the reduced incidence of deaths of these individuals over the study period.

### Data analysis method

Several complementary indicators currently used in mortality studies were applied: life expectancy and mortality rate. As mental disorders mainly appear after the age of 15, we decided to calculate life expectancy at age 15 rather than at birth, which takes into account factors that are not necessarily linked to the pathology studied. Furthermore, it was considered separately according to the gender of the individuals due to the significant differences in life expectancy between men and women. The mortality rates studied include crude death rates, standardised mortality rates by direct standardisation on the age and gender structure of the total French population recorded in 2014 by the National Institute of Statistics and Economic Studies (INSEE), the standardised rates of premature mortality, defined as mortality occurring before the age of 65, and standardised incidences of death per principal cause. Among the causes of death, external causes correspond to deaths that are not directly linked to underlying pathologies such as death by suicide, intoxication, road accidents, a fall, or drowning. The indicators constructed for individuals with a mental disorder were compared to those of the total population of persons that had received healthcare from the French Statutory Health Insurance Scheme (Régime Général) and the sub-schemes (SLM).

G3

**Ratios of general and premature mortality, in 2014, for persons with mental disorders compared with the beneficiaries of the French Social Security System (Régime Général) and the sub-schemes (SLM)**




**Reading:** the standardised rates of general and premature mortality of persons with mental disorders were respectively 2.6 and 4.4 times higher than those of all the beneficiaries of the French Statutory Health Insurance Scheme (Régime Général) and the sub-schemes (SLM) who had consumed healthcare.
**Scope:** Beneficiaries of the French Statutory Health Insurance Scheme (Régime Général) and the sub-schemes (SLM) of the French Statutory Health Insurance Scheme who had consumed healthcare, for the whole of France.
**Source:** National Health Data System (SNDS).
Download the data

ders. The standardised incidence of premature mortality (before the age of 65) was 4.4 times higher among persons with a mental disorder compared with the beneficiaries of the French Statutory Health Insurance Scheme (Régime Général) and the sub-schemes (SLM). The difference is particularly striking among individuals with addictive disorders, which had a standardised incidence of premature mortality 7.5 times higher than that of the beneficiaries of the French Statutory Health Insurance Scheme (Régime Général) and the sub-schemes (SLM) [see Graph 3].

The excess mortality of persons with mental disorders is evident for all causes of death. The highest ratios of excess mortality were observed for external causes of death, with a mortality rate five times higher than that of the general population. The incidence rates were three times higher for digestive system diseases, poorly defined morbid conditions, neurodegenerative diseases, respiratory system diseases, and endocrine diseases, and two times higher for tumours and cardiovascular diseases (see Table 2). With regard to cancers — as in the general population —, lung cancer was the primary disease, with an incidence rate 2.3 times higher for persons suffering from mental disorders.

Among mental disorders, addiction disorders generally had higher mortality ratios than those of the beneficiaries of the French Statutory Health Insurance Scheme (Régime Général) and the sub-schemes (SLM), particularly for deaths linked to digestive system diseases or due to external causes, as well as for deaths linked to poorly defined morbid conditions and infectious diseases.

T2

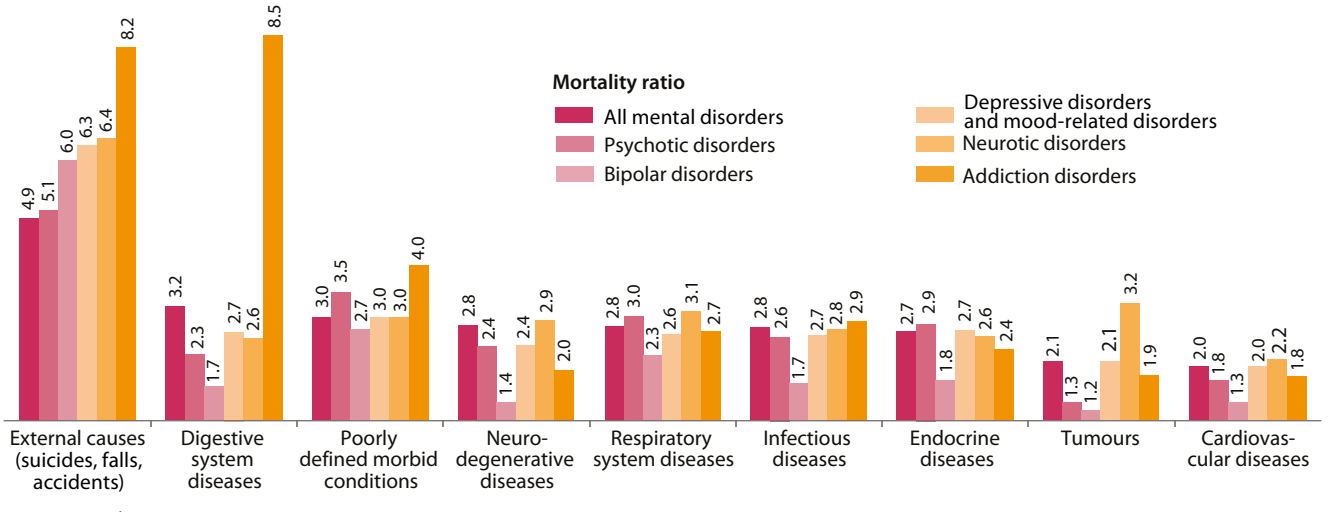
**Mortality ratios between the mortality rate of persons with mental disorders and the mortality rate of beneficiaries of the French Social Security System (Régime Général) and the sub-schemes (SLM) per cause, according to the diagnosis groups treated**

| | Standardised incidence of mortality | | Mortality ratios (all mental pathologies) |
|---|---|---|---|
| | Consumers of the French Social Security System and the sub-schemes | Persons treated for a mental disorder | |
| External causes (accidents, suicides, falls, etc.) | 45.4 | 222.7 | 4.9 |
| Digestive system diseases | 31.9 | 101.4 | 3.2 |
| Poorly defined morbidity conditions | 59.7 | 177.5 | 3.0 |
| Neurodegenerative diseases | 40.9 | 115.6 | 2.8 |
| Respiratory system diseases | 45.8 | 129.0 | 2.8 |
| Infectious diseases | 14.3 | 39.9 | 2.8 |
| Endocrinal diseases | 25.2 | 68.9 | 2.7 |
| Tumours | 235.3 | 499.1 | 2.1 |
| Haematological diseases | 2.7 | 5.6 | 2.1 |
| Cardiovascular diseases | 172.0 | 349.9 | 2.0 |
| General/overall mortality (all causes combined) | 719.9 | 1 886.2 | 2.6 |
| Premature mortality (before the age of 65) | 143.9 | 629.3 | 4.4 |

**Note:** The deaths whose main identified cause was a mental disorder were excluded, because a mental disorder cannot organically lead to death. Incidence rate per 100,000 inhabitants (2014 INSEE standardised reference population).
**Reading:** The standardised incidence of mortality from tumours of persons with a mental disorder was 499.1 per 100,000 habitants, compared with 235.3 for 100,000 for beneficiaries of the French Statutory Health Insurance Scheme (Régime Général) and the sub-schemes (SLM), i.e., an excess mortality ratio of 2.1 for tumours.
**Scope:** Beneficiaries of the French Statutory Health Insurance Scheme (Régime Général) and the sub-schemes (SLM) of the French Statutory Health Insurance Scheme who had consumed healthcare, for the whole of France.
**Source:** National Health Data System (SNDS), INSEE 2014 population census.
Download the data

G4

**Mortality ratios for the principal causes of death, in 2014, of persons with mental disorders, compared with the beneficiaries of the French Social Security System (Régime Général) and the sub-schemes (SLM)**




**Reading:** Persons with mental disorders had a mortality rate due to external causes 4.9 times higher than that of the beneficiaries of the French Statutory Health Insurance Scheme (Régime Général) and the sub-schemes (SLM). This incidence was 6 times higher for bipolar disorders and 8.2 times higher for addiction disorders.
**Scope:** Beneficiaries of the French Statutory Health Insurance Scheme (Régime Général) and the sub-schemes (SLM) of the French Statutory Health Insurance Scheme who had consumed healthcare, for the whole of France.
**Source:** National Health Data System (SNDS), INSEE 2014 population census.

Download the data

Persons with mental disorders were subject to greater excess mortality due to external causes, poorly defined morbid conditions, respiratory system diseases, and endocrine diseases (which may arise from the consequence of side effects linked to the frequency of the prescription of psychotropic drugs for these pathologies). Persons with bipolar disorders were primarily concerned by external causes of death, with their excess mortality primarily due to suicide (a fifteen-fold risk). And persons with depressive and neurotic disorders tended to have particularly high rate of death due to tumours, cardiovascular diseases, and respiratory system diseases (see Graph 4). In the latter cases, these findings may be explained by the fact that the somatic pathology is sometimes at the origin of the mental disorder. Indeed, as the medical cartography of the National Health Insurance Fund (CNAM) was not exclusive, this descriptive analysis does not take into account the anteriority of the development of certain pathologies.

* * *

To date, the first round of French data provides the most exhaustive possible results relating to the mortality of persons with mental disorders on a national scale. Nevertheless, the data is limited due to the estimation of the prevalence of the mental disorders. This was calculated for individuals recently treated in the health system, thereby potentially omitting part of the population that suffered from mental disorders, but which was not undergoing treatment. In addition, the algorithms used were provided by the medical cartography of the National Health Insurance Fund (CNAM) and were essentially developed with the objective of determining the costs associated with various pathologies. An optimisation of these algorithms for an epidemiological use of the cartography could be envisaged to clarify these analyses.

The findings also support certain elements in international literature relating to the determinants of the excess mortality of individuals with mental disorders, such as the real, but limited role of an increased risk of suicide, the role of endocrine and cardiovascular diseases that may be linked to the side effects of psychotropic drugs, and the role of risky health-related behaviours. The excess mortality from lung cancer among individuals living with a mental disorder may be linked to high tobacco consumption (Berg et al., 2013; DiMatteo et al., 2000). Nevertheless, these explanations are fragmented, as the excess mortality has many causes. Life expectancy is indeed determined by a wide range of factors that affect health, such as living conditions, individual behaviours, and the environment, as well as health literacy and access to healthcare (Wahlbeck et al. 2011).

In France, aggregated data objectify the lower access to healthcare for persons with mental disorders, who are far more likely than the general population to have no referring GP (15% compared with 6%), and for whom this access is particulary low for those with the most severe mental disorders (http://santementale.atlasante.fr). Individual data relating to the treatments and gaps in the healthcare of individuals with mental disorders must now be linked with their causes of death in long-term longitudinal studies that take into account numerous individual adjustment factors, including the socio-economic conditions of the individuals studied, and contextual factors. ♦

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## For further informaton


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