

ORIGINAL ARTICLE

Mortality among Paris sewage workers

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Five additional tables are available on the OEM website (www.occenvmed.com/supplemental)

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Objectives: To describe the mortality of Paris sewage workers.

Methods: A cohort of all Paris sewage workers since 1970 was established and followed up in mortality until 1999. The causes of death were determined by matching with a national database. The mortality rates were compared to the rates of a local reference population.

Results: A large excess in mortality (standardised mortality ratio (SMR) = 1.25; 530 cases, 95% CI 1.15 to 1.36) and in particular mortality from cancer (SMR = 1.37, 235 cases) was detected which was particularly important in the subgroup of subjects who had left employment because they resigned or were laid off (SMR = 1.77; 50 cases). The excess mortality is to a large extent due to alcohol related diseases (SMR = 1.65, 122 cases) especially malignant (SMR = 1.85, 16 cases) and non-malignant (SMR = 1.68, 38 cases) liver diseases, lung cancer (SMR = 1.47, 68 cases), and infectious diseases (SMR = 1.86, 25 cases). The SMRs for some diseases (all cancers, cancers of the oesophagus and lung, all alcohol related diseases) seem to increase with duration of employment as a sewage worker. Other than lung cancer, smoking related diseases were not in excess.

Conclusion: The increased mortality by both malignant and non-malignant liver diseases is probably due to excessive alcohol consumption, but could be partially the result of occupational exposure to chemical and infectious agents and interactions of these factors. The excess lung cancer is unlikely to be due to an increased smoking prevalence.

Sewage workers are potentially exposed to a number of chemical and biological agents, and acute symptoms arising among sewage workers and other wastewater workers are well described.^{1,2} However epidemiological literature concerning chronic effects are scarce and contradictory. To our knowledge, only four published studies have described the mortality or cancer incidence of subjects exposed to wastewater.³⁻⁵ Depending on the studies, excesses in cancers of the larynx,³ liver,³ and stomach³⁻⁵ have been observed. This paper reports on a mortality follow up of the population of Paris sewage workers.

POPULATION AND METHODS

Exposure

The Paris sewage system is a vast network of underground canals whose network duplicates nearly perfectly the street network. It drains the waste water towards the treatment plants. The sewage system consists of three typical environments:

- Small (primary) lines connect buildings to the sewage system. The diameters of these lines vary from 1.2 to 2.0 m. When these lines need to be cured, the sewage workers intervene directly with handheld tools.
- Secondary and main collectors (canals) regroup the output of the primary lines. These collectors are larger and small sidewalks allow the workers to walk along these canals. The clearing of these canals is done using wagons or boats allowing the regulation of the flow of the wastewater.
- More or less large sedimentation basins slow down the wastewater flow in order to get rid of the sediments which are extracted by aspiration from the streets.

The job of the sewage workers consists in the inspection of lines in order to detect any perturbation of the wastewater

flow and possible defaults (for example, cracks, leaks) of the duct, the curing of the wastewater lines and the extraction of the sediments. In recent years the latter job has been subcontracted. Finally a number of maintenance tasks (for example, masonry, carpentry) are generally done by specialised personnel. In the past this also included more indirectly exposed personnel like shoemakers.

The sewage workers are exposed both to chemical and biological agents. A first source of exposure to chemical agents, in particular to sulphur compounds (hydrogen sulfide, mercaptans), carbon monoxide, methane, aldehydes, and organic acids, occurs through the decomposition of urine and faeces in either aerobic or anaerobic conditions. These chemicals are notably released in the air during the curing and extraction operations. A second possible source of chemical exposure is when industries dump their waste into the sewage system. In recent years this exposure diminished sharply because regulations on waste recycling became tighter and were enforced more strictly, and because the number of manufacturing plants within the city of Paris decreased regularly. However hundreds of chemical substances have been shown to exist in the wastewater.⁷⁻⁹

Biological exposure arises through inhalation of wastewater aerosols, skin contact with the wastewater, or ingestion, and includes potential exposure to Gram negative bacilli, endotoxins, faecal streptococci, and a range of viruses. A recent survey of the endotoxin exposure in Dutch wastewater treatment workers² however showed relatively low exposure levels (geometric mean 27 EU/m³). Similar exposure levels were measured in Paris sewage workers (Duquenne P, Ambroise D, unpublished report).

Population and follow up

The population comprised all male Paris sewage workers having worked between 1 January 1970 and 31 December

1999. No selection on duration of employment was applied. The population was identified in the computerised register of all employees of the city of Paris. The extracted list was compared to the paper files of the personnel department responsible for the sewage workers. A final control of completeness was done by comparing the yearly numbers of sewage workers reported in historical reports of the corresponding personnel department.

The population was followed up for mortality between the 1 January 1970 and 31 December 1999. For each worker we gathered information on date and place of birth, end of employment, and cause of leaving employment, as well as full history as an employee of the city of Paris (similar to civil servant status) from the personnel files. This civil service-like status gives the sewage workers the right to retire with a full pension at age 50 under certain conditions. However no detailed job codes could be obtained. We assessed vital status by writing to the registry offices of the birthplaces and by searching a computerised database of all subjects who had died in France since 1978. Thus foreign born subjects were considered lost to follow up on the day of leaving employment. This procedure of identifying deceased subjects has been shown to be the most reliable in several cohort studies.¹⁰⁻¹² We obtained the cause of death by matching the file of deceased subjects with the national file of causes of death, which has existed since 1968. The causes of death are coded according to the 8th revision of the ICD until 1978 and according to the 9th until end of follow up.

Data analysis

We compared the mortality of the cohort with the death rates of the "Département de Seine St Denis" which is an administrative district within the Parisian region comprising more than a million inhabitants and is characterised by its large proportion of blue-collar workers. The Paris and regional mortality rates, due to the predominantly white-collar population, are much lower and are not an adequate reference.

Each worker contributed person-time to the follow up from the moment of his hire as a sewage worker or the 1 January 1970, whichever came later, to the time of death, loss to follow up, or 31 December 1999, whichever came first.

We obtained standardised mortality ratios (SMRs) by dividing observed numbers of deaths by causes and groups of causes by age period standardised expected numbers and computed exact 95% confidence intervals (95% CIs) with the usual Poisson assumption. In addition to the standard groupings of causes, we computed the rates for alcohol related diseases (cancers of the buccal cavity, pharynx, larynx, oesophagus, and the liver, non-malignant diseases of the liver and pancreatitis, and alcoholism (ICD291 and 303)). A second non-standard grouping of causes was the group of all infectious diseases, grouping all diseases of the first chapter of the ICD and all other infectious diseases (for example, pneumonia). AIDS was excluded from this group of causes, given its predominance as a cause of death among the infectious diseases since the late 1980s. SMRs were further obtained by cause of leaving employment and by duration of work as a sewage worker. Person-time at any time point was allocated to the category to which the death would have been allocated, had it occurred at this point in time.

The statistical analysis was performed using the STATA 8 software using the series of Stata's survival analysis routines (the "st" ado-files) (Stata, College Station, TX, USA).

RESULTS

The cohort comprised 1722 subjects, 408 of whom were still active and 1182 still alive at the end of follow up. While a majority of the subjects no longer at work (755) were

retired or, to be more precise, were on a retirement pension, a significant part (269) of the cohort members left disabled—that is, for medical reasons and for other reasons (181). These individuals had usually been laid off or had resigned.

Follow up was nearly complete as only eight subjects were foreign born; for two subjects the birthplace was missing. The number of unknown causes for which no match could be found in the national database was small.

Overall, mortality was in excess (table 2; see also online table 1 at <http://www.occenvmed.com/supplemental> for more causes of death) which was mainly due to the large excess in cancer mortality. This excess was even larger when compared to national or regional rates (data not shown). The excess in cancer mortality is to a large extent due to cancers of the digestive tract, in particular cancer of the oesophagus and the liver. We note also the excesses of cancers of the pleura and the brain. Although the mortality from non-malignant respiratory diseases and cardiovascular diseases does not differ significantly from the expected, mortality from the diseases of the nervous system and from suicides are in significant excess. With respect to the risk factors potentially associated with the exposure, the significantly increased risks of all infectious diseases and non-malignant diseases of the digestive tract are of particular interest. Within the latter the increased risk of diseases of the liver not specifically related to alcohol is of particular interest, especially with regard to the high SMR for all diseases related to alcohol.

With respect to causes for leaving employment (table 3; see also online table 2 at <http://www.occenvmed.com/supplemental>), the group with the highest overall mortality is the group of subjects having left for other reasons—most of which had a very short duration of employment (data not shown). In this group, all causes—especially alcohol related diseases and infectious diseases—are in excess, which points towards a selected population for its bad life hygiene. As could be expected, the subjects who had left employment for medical reasons had a higher mortality than retired subjects. The mortality among active sewage workers was lower than in the other groups, with the exception of the significant excess of mortality from non-malignant diseases of the liver not specifically related to alcohol.

When including the subjects who had left for "other reasons" the mortality of the short term employees (less than 10 years) is high for many causes (data not shown but

Table 1 Cohort characteristics

	n	%
Subjects by vital status		
Alive at end of follow up	1182	69%
Deceased with known cause	515	30%
Deceased with unknown cause	15	1%
Lost to follow up	10	1%
Subjects by cause of leaving employment		
Active at end of follow up	408	24%
Died while active	109	6%
Retired	755	44%
Left for medical reasons	269	16%
Left for other reasons	181	11%
Total number of subjects	1722	100%
Mean duration of follow up in years	21.9	
Number of person-years by age		
<40 years	9875	26%
40-49 years	10519	28%
50-59 years	9573	25%
60-69 years	5868	16%
>70 years	1954	5%
Total number of person-years	37788	100%

Table 2 Mortality from main causes of death

Cause of death (codes from ICD 9)	Observed	Expected	SMR	95% CI
All causes	530	423.65	1.25	1.15–1.36
All cancers (1–208.9)	235	171.07	1.37	1.20–1.56
Upper digestive tract (140–151)	52	33.70	1.54	1.15–2.02
Lip, oral cavity, pharynx (140–149)	25	15.75	1.59	1.03–2.34
Oesophagus (150)	22	11.15	1.97	1.24–2.99
Stomach (151)	5	6.80	0.74	0.24–1.72
Other digestive (152–159)	42	29.73	1.41	1.02–1.91
Liver (155)	16	8.65	1.85	1.06–3.00
Nasal cavities and sinuses (160)	8	4.97	1.61	0.69–3.17
Larynx (161)	10	9.28	1.08	0.52–1.98
Lung (162)	68	46.27	1.47	1.14–1.86
Pleura (163)	3	1.68	1.79	0.36–5.22
Bladder (188)	4	5.74	0.70	0.19–1.78
Brain (191)	5	2.58	1.94	0.63–4.52
All diseases of the nervous system (290–315)	15	6.58	2.28	1.27–3.76
Alcohol dependence syndrome (303)	8	4.3	1.86	0.80–3.67
All cardiovascular diseases (390–459)	105	97.25	1.08	0.88–1.31
Ischaemic heart diseases (410–414)	37	40.68	0.91	0.64–1.25
Non-malignant respiratory diseases (460–519)	20	20.51	0.98	0.60–1.51
COPD (491, 496)	7	6.69	1.05	0.42–2.16
Infectious respiratory diseases (460–474, 472–473)	10	6.45	1.55	0.74–2.85
Non-malignant diseases of the digestive tract (520–579)	48	34.01	1.41	1.04–1.87
Chronic liver diseases explicitly related to alcohol (571.0–571.3)	17	12.60	1.35	0.79–2.16
Other chronic non-malignant diseases of the liver (571.4–571.9)	21	10.04	2.03	1.25–3.10
All violent causes (E800–E999)	34	26.52	1.28	0.89–1.79
Suicides (E950–E959)	16	5.52	2.90	1.66–4.71
All infectious diseases (see text)	25	13.41	1.86	1.21–2.75
All alcohol related diseases (see text)	122	73.95	1.65	1.37–1.97

COPD, chronic obstructive pulmonary disease.

Table 3 Standardised mortality ratios (number of deaths) from selected causes according to causes for leaving employment

Cause of death	Active (517) (95% CI)	Retired (755) (95% CI)	Medical reasons (269) (95% CI)	Other reasons (181) (95% CI)
All causes	1.12 (107) (0.92–1.35)	1.19 (265) (1.05–1.35)	1.39 (108) (1.14–1.68)	1.77 (50) (1.32–2.34)
All cancers	1.15 (35) (0.80–1.59)	1.40 (133) (1.18–1.66)	1.35 (46) (0.99–1.80)	1.81 (21) (1.12–2.77)
Oesophagus	1.15 (3) (0.24–3.37)	1.59 (9) (0.73–3.02)	2.83 (6) (1.03–6.16)	5.10 (4) (1.39–13.1)
Liver	2.25 (2) (0.27–8.11)	2.29 (12) (1.18–4.00)	1.05 (2) (0.13–3.78)	0
Lung	0.68 (5) (0.22–1.59)	1.53 (40) (1.09–2.08)	1.57 (15) (0.88–2.60)	2.47 (8) (1.06–4.87)
All cardiovascular diseases	0.95 (15) (0.53–1.57)	0.93 (53) (0.70–1.22)	1.49 (28) (0.99–2.15)	1.55 (9) (0.71–2.95)
Ischaemic heart diseases	0.99 (7) (0.40–2.05)	0.69 (16) (0.39–1.12)	1.14 (9) (0.52–2.16)	2.02 (5) (0.66–4.72)
Chronic liver diseases explicitly related to alcohol	1.03 (4) (0.28–2.64)	1.60 (9) (0.73–3.03)	1.39 (3) (0.29–4.05)	1.09 (1) (0.03–6.10)
Other chronic non-malignant diseases of the liver	2.69 (9) (1.23–5.10)	0.65 (3) (0.13–1.90)	3.45 (6) (1.26–7.51)	4.48 (3) (0.93–13.2)
All infectious diseases	1.32 (4) (0.36–3.38)	1.81 (13) (0.96–3.10)	1.26 (3) (0.26–3.69)	6.13 (5) (1.99–14.3)
Alcohol related diseases	1.39 (28) (0.92–2.00)	1.62 (57) (1.23–2.10)	1.79 (24) (1.15–2.67)	2.50 (13) (1.33–4.28)

Table 4 Standardised mortality ratios (number of deaths) from selected causes according to duration of employment after exclusion of subjects having left for other reasons

	<10 years	10–19 years	20 years +
All causes	1.16 (27) (0.77–1.69)	1.14 (186) (0.99–1.32)	1.27 (267) (1.13–1.44)
All cancers	0.88 (5) (0.29–2.06)	1.27 (81) (1.01–1.58)	1.42 (128) (1.19–1.69)
Oesophagus	0	0.70 (3) (0.14–2.05)	2.63 (15) (1.47–4.34)
Liver	0	2.70 (8) (1.17–5.33)	1.65 (8) (0.71–3.24)
Lung	0.76 (1) (0.02–4.23)	1.13 (19) (0.68–1.77)	1.60 (40) (1.15–2.18)
All cardiovascular diseases	1.31 (4) (0.36–3.36)	0.91 (34) (0.63–1.27)	1.14 (58) (0.86–1.47)
Ischaemic heart diseases	1.61 (2) (0.19–5.81)	0.70 (11) (0.35–1.26)	0.89 (19) (0.54–1.39)
Chronic liver diseases explicitly related to alcohol	0	0.99 (5) (0.32–2.30)	1.86 (11) (0.93–3.32)
Other chronic non-malignant diseases of the liver	1.75 (1) (0.04–9.75)	2.29 (10) (1.10–4.21)	1.47 (7) (0.59–3.03)
All infectious diseases	0	1.52 (8) (0.65–2.99)	1.83 (12) (0.94–3.19)
Alcohol related diseases	1.18 (4) (0.32–3.01)	1.49 (43) (1.06–1.98)	1.72 (62) (1.32–2.20)

available in online tables 3 and 4 at <http://www.occenvmed.com/supplemental>). When excluding these subjects (table 4; see also online table 5 at <http://www.occenvmed.com/supplemental>) the mortality from cancer increases with duration of employment as a sewage worker, although non-significantly. This increase can also be seen for cancer of the oesophagus and lung cancer, while mortality from liver cancer is highest in the group having worked for 10–20 years. No clear pattern can be distinguished in the analysis by time since first employment as a sewage worker (data available online).

DISCUSSION

The main findings of this study are the overall excess mortality compared with the expected, the excess mortality for cancer and, within those, the excess for lung cancer and liver cancer. Among the other causes of death in noticeable excess are the non-malignant liver diseases not specifically related to alcohol and the excess from infectious diseases.

Our results are stated as comparisons with reference rates with a nearby geographical area whose socioeconomic structure seemed more adequate than either the national or the Parisian population—for example, the expected number of pleural cancers were 1.00 with national rates compared to the 1.68 with the rates we used. Had we used national rates, most of the SMRs would have been higher especially with respect to cancer. However it is impossible to assess the bias involved in this comparison. Another methodological weakness of this study is the absence of any precise job codes. Given that the identified population exceeded the numbers of sewage workers mentioned in historical documents, it is probable that a number of subjects whose actual job was not in the sewers but who were administratively attached to the sewage workers, were included in this population. A consequence is a possible dilution of a possible occupational risk. However the excess number of subjects was less than 10% of the population.

One of the main features in the mortality of this population is the increased mortality from alcohol related diseases. Interviews with managers and occupational physicians confirmed that excessive alcohol consumption was, or at least had been, a major hazard in this population. Less than optimal personal hygiene is also documented by the excess mortality from infectious diseases. However it is highly unlikely that this excess in infectious diseases is due to occupational factors as most of the excess arose after the subject left employment. A particularly fragile group is the group of subjects who left for other reasons. Given the social advantages (in particular early retirement) attached to the job as a Paris sewage worker, this group probably consists of socially unstable subjects.

The excess of chronic diseases of the liver (both malignant and non-malignant) may however not only be attributable to the excessive alcohol consumption. Thus the excess of liver diseases explicitly related to alcohol is of a lesser excess than other liver diseases, which could point towards an occupational origin. Of course, the fact that alcohol is not mentioned in the cause does not mean that it is absent, and some misclassification is likely; however there is no reason why this misclassification should be larger among the death codes of sewage workers than in the general population. Among the possible causes for chronic non-malignant liver diseases are infections via the hepatitis viruses. The hepatitis A virus seroprevalence in Paris sewage workers was found to increase with age, reaching 80% for workers older than 40, in a recent cross sectional study.¹³ However no difference in seroprevalence was found in a group of workers from a the largest wastewater treatment plant nor in a group of non-exposed

Main messages

- The mortality of the Paris sewage workers is increased mainly as a result of alcohol related diseases.
- Significant mortality excesses from malignant and non-malignant liver disease as well as from lung cancer may be partially caused by occupational exposure.

controls. This agrees with a recent review¹⁴ which did not confirm an increased risk of hepatitis A prevalence in workers exposed to sewage. On the other hand, among the detailed causes only two were coded ICD9-571.4—that is, chronic hepatitis, with 10 coded ICD9-571.5 (cirrhosis of liver, not otherwise specified) and nine coded ICD9-571.9 (chronic liver disease, not otherwise specified). On the other hand hepatitis A, contrary to hepatitis B and C, is not known to be a risk factor for cirrhosis. In this context the recent study of Arvanitidou *et al* describing a hepatitis B seroprevalence related to occupational exposure to sewage is of particular interest.¹⁵ However no such information is available for Paris sewage workers.

The statistically significant excess of mortality from liver cancer we observed is noteworthy not only in the context of an increased mortality from cirrhosis, as a similar excess was observed both among Buffalo sewage workers³ (3 cases *v* 0.6 expected) and among Danish wastewater workers⁶ (4 cases *v* 0.8 expected). Note that we did not include biliary tract cancers (one further case) as these are coded 156 in ICD9. In both these cohorts no excess mortality exists with respect to other alcohol related diseases. Hansen *et al* discuss the possibility of an aflatoxin B exposure, a mycotoxin produced by certain *Aspergillus* species which is believed to be responsible together with hepatitis and cirrhosis for most liver cancer especially in poor countries.⁶ A few measurements with a bioaerosol impactor (unpublished internal report) carried out in the sewage showed the presence of *Aspergillus* species in the ambient air. Thus it is not impossible that the sewage workers were exposed to airborne aflatoxin B. However, so far, the carcinogenic potential for the liver from aflatoxin exposure has only been shown with the direct ingestion of contaminated crops. Nothing is known concerning risk of liver cancer with respect to airborne exposure. Hansen *et al* also mention the possibility of exposure to halogenated solvents, which have been shown to exist in the Copenhagen sewers.⁶ Although no comparable data exist for the Paris sewers, we have little doubt that the exposure is similar. However the first aetiology of these excesses in liver cancer mortality that one thinks of is alcoholic cirrhosis and this cause is mentioned explicitly as an associated cause of death for five cases, two of which had hepatitis as a secondary associate cause (one hepatitis B ICD9 070.3, one unspecified, ICD9 070.5), moreover two other cases had chronic liver diseases as associate causes (one non-specific cirrhosis ICD9 571.5 and one non-classified chronic liver disease ICD9-571.8). Given the preceding discussion, the most likely cause for the excess in liver cancer mortality is a combination of excessive alcohol consumption and occupational factors among which occupation induced infectious diseases are the most likely factor. Even before the results of the present study were known, the medical unit of the city of Paris responsible for the medical follow up of the sewage workers started an ongoing action of alcoholism prevention, and in recent years the vaccination against both hepatitis A and B became compulsory for all sewage workers as well as strict hygiene requirements aimed at reducing the exposure to infectious agents. It can therefore be expected that the

increased mortality from liver diseases will be reduced in the future.

A second cancer site in significant excess is the lung. This is to be interpreted bearing in mind that the observed mortality from most of the other causes whose main aetiology is smoking is close to the expected mortality. Thus the SMR for bladder cancer is 0.70 (four cases), cancer of the larynx 1.08 (10 cases), chronic obstructive pulmonary disease 1.05 (seven cases), and ischaemic heart disease 0.91 (37 cases) which does not suggest a high smoking prevalence. On the other hand a recent survey carried out in 2002 indicated that the present smoking prevalence is high, with 71% smokers or ex-smokers. The excess from pleural cancers (SMR = 1.78), although based only on three cases, is noteworthy too especially because no asbestos has been used by the sewage workers and because the mortality rates in the reference population are among the highest in France. This indirectly suggests that toxic industrial substances have probably been dumped in sewers in the past, which could explain at least partially the excess in lung cancer. The fact that the lung cancer SMRs increase with duration of employment as a sewage worker (SMR = 1.60, 40 cases for subjects with more than 20 years employment) is a further indication as to a possible occupational risk.

Finally we comment on two other cancer sites. Mortality from cancer of the nasal cavities and sinuses are in non-significant excess, although the known occupational aetiologies (wood dust and nickel compounds) seem unlikely in the present context. It must be noted that a similar excess was found by Friis *et al.*⁴ No excess of stomach cancer (SMR = 0.74, five cases) was found contrary to the wastewater workers in Buffalo,³ Sweden,⁴ and Italy.⁵

CONCLUSION

The increased mortality by both malignant and non-malignant liver disease is probably the result of excessive alcohol consumption but could be partially caused by occupational exposure to chemical and infectious agents and interactions of these factors. The excess lung cancer is unlikely to be caused by an increased smoking prevalence.

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Overall mortality by cause of the population of sewage workers

disease group	cause	observed	expected	smr	CI95_inf	CI95_sup	icd8	icd9
	All causes	530	423.65	1.251	1.146745	1.362222	1-999.9	1-999.9 1.0-139.9
Infectious diseases	Infectious diseases Ch I except AIDS	10	5.74	1.7413	0.8336265	3.204116	1.0-139.9	exc. 41.0-45.0
Malignant diseases	All cancers	235	171.07	1.374	1.203921	1.561037	140.0-209.9	140.0-208.9
Malignant diseases	Head and neck 1	35	25.03	1.398	0.9736089	1.944797	140.0-149.9, 161.0-161.9	140.0-149.9, 161.0-161.9
Malignant diseases	Head and neck 2	43	29.99	1.434	1.037682	1.931392	140.0-149.9, 160.2-161.9	140.0-149.9, 160.2-161.9
Malignant diseases	Upper digestive tract	52	33.7	1.543	1.152297	2.023524	140.0-151.9	140.0-151.9
Malignant diseases	Other digestive cancer	42	29.73	1.413	1.018252	1.909638	152.0-159.9	152.0-159.9
Malignant diseases	Oesophagus	22	11.15	1.973	1.236028	2.987444	150.0-150.9	150.0-150.9
Malignant diseases	Stomach	5	6.8	0.7354	0.239005	1.716424	151.0-151.9	151.0-151.9
Malignant diseases	Small bowel and colon	11	9.04	1.2168	0.6065875	2.177368	152.0-153.9	152.0-153.9
Malignant diseases	Rectum	2	3.23	0.6198	0.0749958	2.238718	154.0-154.9	154.0-154.9
Malignant diseases	Liver	16	8.65	1.849	1.056173	3.004004	155.0-155.9	155.0-155.9
Malignant diseases	Pancreas	7	5.69	1.2306	0.4930098	2.534871	157.0-157.9	157.0-157.9
Malignant diseases	Peritoneum	0	0.27	0			158.0-158.9	158.0-158.9
Malignant diseases	Nasal cavity and sinuses	8	4.97	1.6102	0.6933184	3.171863	160.0-160.9	160.0-160.9
Malignant diseases	Larynx	10	9.28	1.0773	0.5157444	1.981856	161.0-161.9	161.0-161.9
Malignant diseases	Lung	68	46.27	1.47	1.141456	1.863147	162.0-162.9	162.0-162.9
Malignant diseases	Pleura	3	1.68	1.7837	0.3674422	5.211971	"163	163.0-163.9
Malignant diseases	Bone and soft tissues	1	1.48	0.67545	0.0168863	3.763608	170.0-171.9	170.0-171.9
Malignant diseases	Skin	1	0.94	1.0597	0.0264925	5.904648	172.0-172.9	172.0-172.9
Malignant diseases	Prostate	9	7.34	1.2256	0.5592577	2.327785	185.0-185.9	185.0-185.9
Malignant diseases	Testis	0	0.3	0			186.0-186.9	186.0-186.9
Malignant diseases	Bladder	4	5.74	0.6965	0.189448	1.78304	188.0-188.9	188.0-188.9
Malignant diseases	Urinary tract	4	3.54	1.1295	0.307224	2.89152	189.0-189.9	189.0-189.9
Malignant diseases	Brain	5	2.58	1.9374	0.6296549	4.521892	191.0-191.9	191.0-191.9
Malignant diseases	Thyroid and other endocrine	0	0.45	0			193.0-194.9	193.0-194.9
Malignant diseases	Lymphoma	1	4.94	0.20243	0.0050608	1.12794	200.0-203.9	200.0-203.9
Malignant diseases	Leukaemia	5	3.55	1.4065	0.4571125	3.282771	204.0-207.9	204.0-208.9
Endocrine diseases	All endocrine	10	6.12	1.6352	0.7828324	3.005168	240.0-279.9	240.0-279.9
Non-malignant blood diseases	All non-malignant blood diseases	0	1.35	0			280.0-289.9	280.0-289.9

Mental diseases	All mental diseases	15	6.58	2.28	1.275154	3.760156	290.0-315.9	290.0-319.9
Mental diseases	Alcoholic dementia	0	0.58	0			291.0-291.9	291.0-291.9
Mental diseases	Alcoholic dependence	8	4.3	1.86	0.8008771	3.666083	303.0-303.9	303.0-303.9
Non-malignant diseases nervous system	All diseases of the nervous sytem	8	6.25	1.2798	0.5510551	2.522265	320.0-389.9	320.0-389.9
Cardio-vascular	All cardio-vascular	105	97.25	1.0797	0.8830655	1.307048	390.0-459.9	390.0-459.9
Cardio-vascular	Hypertensive diseases	3	2.7	1.1131	0.2292986	3.252478	400.0-404.9	401.0-405.9
Cardio-vascular	IHD	37	40.68	0.9095	0.6402829	1.253721	410.0-414.9	410.0-414.9
Cardio-vascular	pulmonary heart disease	5	1.86	2.682	0.8716499	6.259788	450.0-450.9	415.0-415.9
Cardio-vascular	cardiac dysrhythmias	4	4.7	0.8513	0.2315536	2.179328	427.2, 427.9	426.0-427.9
Cardio-vascular	heart failure	10	8.11	1.2327	0.5901403	2.267771	427.0-427.1	428.0-428.9
Cardio-vascular	cerebro-vascular diseases	23	20.35	1.1301	0.7161514	1.695972	430.0-438.9	430.0-438.9
Cardio-vascular	diseases of the arteries	10	8.18	1.2224	0.5852093	2.248365	440.0-448.9	440.0-448.9
Cardio-vascular	veinous diseases	1	1.42	0.70614	0.0176535	3.934612	451.0-458.9	451.0-459.9
Non-malignant respiratory diseases	All respiratory diseases	20	20.51	0.9752	0.5954236	1.506099	460.0-519.9	460.0-519.9
Non-malignant respiratory diseases	Emphysema	0	0.75	0			492.0-492.9	492.0-492.9
Non-malignant respiratory diseases	COPD	7	6.69	1.0456	0.4188941	2.155966	491.0-491.9	491.0-491.9, 496.0-496.9
Non-malignant digestive diseases	All digestive diseases	48	34.01	1.411	1.040268	1.871295	520.0-577.9	520.0-577.9
Non-malignant digestive diseases	Duodenal ulcer	0	1.3	0			531.0-532.9	531.0-532.9
Non-malignant digestive diseases	Liver diseases	38	22.97	1.654	1.170313	2.270775	571.0-571.9	571.0-571.9
Non-malignant digestive diseases	Alcoholic liver diseases	17	12.6	1.3492	0.7855021	2.160342	"571	571.0-571.3
Non-malignant digestive diseases	Other liver diseases	21	10.37	2.025	1.25302	3.095705	571.1-571.9	571.4-571.9
Non-malignant digestive diseases	pancreatitis	3	1.26	2.3788	0.4900328	6.950853	577.0-577.1	577.0-577.1
Non-malignant urinary and genital diseases	All urinary and genital diseases	1	3.48	0.28699	0.0071747	1.599108	580.0-629.9	580.0-629.9
Ill-defined diseases	Ill-defined diseases	25	35.13	0.7116	0.4603805	1.050574	780.0-799.9	780.0-799.9
Violent causes	All violent causes	34	26.52	1.2821	0.8877481	1.791604	E800.0-E999.8	E800.0-E999.8
Violent causes	Suicides	16	5.52	2.898	1.655376	4.707362	E950.0-E959.9	E950.0-E959.9
Violent causes	Travel accidents	2	5.73	0.34931	0.0422665	1.261708	E810.0-E828.9	E810.0-E827.9, E916.0-E921.9, E916.0-E921.9, E923.0-E927.9
Violent causes	Work-related accidents	0	0.42	0			E916.0-E921.9, E923.0-E927.9	
Infectious diseases	All infectious diseases except AIDS	25	13.41	1.865	1.20659	2.752176		
Non-malignant respiratory diseases	Infectious respiratory diseases	10	6.45	1.5504	0.7422354	2.851415		
	diseases specifcily related to alcohol	25	17.48	1.4299	0.9250956	2.111366		
	All alcohol related diseases	122	73.95	1.65	1.370198	1.96984		

Mortality by causes for leaving employment for selected causes									
disease group	cause	Cause	observed	expected	smr	CI95_inf	CI95_sup	icd8	icd9
	All causes	Active	107	95.48	1.12	0.92	1.35	1-999.9	1-999.9
	All causes	Retired	265	222.18	1.19	1.05	1.35	1-999.9	1-999.9
	All causes	Medical reasons	108	77.8	1.39	1.14	1.68	1-999.9	1-999.9
	All causes	Other reasons	50	28.2	1.77	1.32	2.34	1-999.9	1-999.9
Infectious diseases	Infectious diseases Ch I except AIDS	Active	4	1.59	2.52	0.69	6.45	1.0-139.9	1.0-139.9 exc. 41.0-45.0
Infectious diseases	Infectious diseases Ch I except AIDS	Retired	6	2.82	2.12	0.78	4.63	1.0-139.9	1.0-139.9 exc. 41.0-45.0
Infectious diseases	Infectious diseases Ch I except AIDS	Medical reasons	0	0.97	0.00			1.0-139.9	1.0-139.9 exc. 41.0-45.0
Infectious diseases	Infectious diseases Ch I except AIDS	Other reasons	0	0.36	0.00			1.0-139.9	1.0-139.9 exc. 41.0-45.0
Malignant diseases	All cancers	Active	35	30.52	1.15	0.80	1.59	140.0-209.9	140.0-208.9
Malignant diseases	All cancers	Retired	133	94.77	1.40	1.18	1.66	140.0-209.9	140.0-208.9
Malignant diseases	All cancers	Medical reasons	46	34.18	1.35	0.99	1.80	140.0-209.9	140.0-208.9
Malignant diseases	All cancers	Other reasons	21	11.6	1.81	1.12	2.77	140.0-209.9	140.0-208.9
Malignant diseases	Head and neck 1	Active	8	7.16	1.12	0.48	2.20	140.0-149.9, 161.0-161.9	140.0-149.9, 161.0-161.9
Malignant diseases	Head and neck 1	Retired	17	11.58	1.47	0.86	2.35	140.0-149.9, 161.0-161.9	140.0-149.9, 161.0-161.9
Malignant diseases	Head and neck 1	Medical reasons	6	4.52	1.33	0.49	2.89	140.0-149.9, 161.0-161.9	140.0-149.9, 161.0-161.9
Malignant diseases	Head and neck 1	Other reasons	4	1.78	2.25	0.61	5.75	140.0-149.9, 161.0-161.9	140.0-149.9, 161.0-161.9
Malignant diseases	Head and neck 2	Active	9	7.84	1.15	0.52	2.18	140.0-149.9, 160.2-161.9	140.0-149.9, 160.2-161.9
Malignant diseases	Head and neck 2	Retired	22	14.39	1.53	0.96	2.31	140.0-149.9, 160.2-161.9	140.0-149.9, 160.2-161.9
Malignant diseases	Head and neck 2	Medical reasons	8	5.58	1.43	0.62	2.83	140.0-149.9, 160.2-161.9	140.0-149.9, 160.2-161.9
Malignant diseases	Head and neck 2	Other reasons	4	2.18	1.84	0.50	4.70	140.0-149.9, 160.2-161.9	140.0-149.9, 160.2-161.9
Malignant diseases	Oesophagus	Active	3	2.6	1.15	0.24	3.37	150.0-150.9	150.0-150.9
Malignant diseases	Oesophagus	Retired	9	5.65	1.59	0.73	3.02	150.0-150.9	150.0-150.9
Malignant diseases	Oesophagus	Medical reasons	6	2.12	2.83	1.03	6.16	150.0-150.9	150.0-150.9
Malignant diseases	Oesophagus	Other reasons	4	0.78	5.10	1.39	13.06	150.0-150.9	150.0-150.9
Malignant diseases	Liver	Active	2	0.89	2.25	0.27	8.11	155.0-155.9	155.0-155.9
Malignant diseases	Liver	Retired	12	5.24	2.29	1.18	4.00	155.0-155.9	155.0-155.9

Malignant diseases	Liver	Medical reasons	2	1.91	1.05	0.13	3.78	155.0-155.9	155.0-155.9
Malignant diseases	Liver	Other reasons	0	0.61	0.00			155.0-155.9	155.0-155.9
Malignant diseases	Nasal cavity and sinuses	Active	1	0.69	1.45	0.04	8.10	160.0-160.9	160.0-160.9
Malignant diseases	Nasal cavity and sinuses	Retired	5	2.82	1.77	0.58	4.14	160.0-160.9	160.0-160.9
Malignant diseases	Nasal cavity and sinuses	Medical reasons	2	1.06	1.88	0.23	6.79	160.0-160.9	160.0-160.9
Malignant diseases	Nasal cavity and sinuses	Other reasons	0	0.4	0.00			160.0-160.9	160.0-160.9
Malignant diseases	Larynx	Active	1	2.75	0.36	0.01	2.02	161.0-161.9	161.0-161.9
Malignant diseases	Larynx	Retired	6	4.25	1.41	0.52	3.07	161.0-161.9	161.0-161.9
Malignant diseases	Larynx	Medical reasons	3	1.66	1.81	0.37	5.27	161.0-161.9	161.0-161.9
Malignant diseases	Larynx	Other reasons	0	0.62	0.00			161.0-161.9	161.0-161.9
Malignant diseases	Lung	Active	5	7.32	0.68	0.22	1.59	162.0-162.9	162.0-162.9
Malignant diseases	Lung	Retired	40	26.17	1.53	1.09	2.08	162.0-162.9	162.0-162.9
Malignant diseases	Lung	Medical reasons	15	9.53	1.57	0.88	2.60	162.0-162.9	162.0-162.9
Malignant diseases	Lung	Other reasons	8	3.24	2.47	1.06	4.87	162.0-162.9	162.0-162.9
Malignant diseases	Brain	Active	2	0.69	2.90	0.35	10.49	191.0-191.9	191.0-191.9
Malignant diseases	Brain	Retired	3	1.24	2.43	0.50	7.09	191.0-191.9	191.0-191.9
Malignant diseases	Brain	Medical reasons	0	0.46	0.00			191.0-191.9	191.0-191.9
Malignant diseases	Brain	Other reasons	0	0.19	0.00			191.0-191.9	191.0-191.9
Endocrine diseases	All endocrine	Active	2	1.11	1.80	0.22	6.50	240.0-279.9	240.0-279.9
Endocrine diseases	All endocrine	Retired	5	3.46	1.45	0.47	3.37	240.0-279.9	240.0-279.9
Endocrine diseases	All endocrine	Medical reasons	2	1.16	1.72	0.21	6.22	240.0-279.9	240.0-279.9
Endocrine diseases	All endocrine	Other reasons	1	0.38	2.61	0.07	14.52	240.0-279.9	240.0-279.9
Mental diseases	All mental diseases	Active	4	2.14	1.87	0.51	4.79	290.0-315.9	290.0-315.9
Mental diseases	All mental diseases	Retired	7	2.92	2.40	0.96	4.94	290.0-315.9	290.0-315.9
Mental diseases	All mental diseases	Medical reasons	2	1.05	1.90	0.23	6.85	290.0-315.9	290.0-315.9
Mental diseases	All mental diseases	Other reasons	2	0.47	4.27	0.52	15.41	290.0-315.9	290.0-315.9
Mental diseases	Alcoholic dependence	Active	2	1.53	1.31	0.16	4.72	303.0-303.9	303.0-303.9
Mental diseases	Alcoholic dependence	Retired	4	1.75	2.29	0.62	5.85	303.0-303.9	303.0-303.9
Mental diseases	Alcoholic dependence	Medical reasons	1	0.69	1.44	0.04	8.02	303.0-303.9	303.0-303.9
Mental diseases	Alcoholic dependence	Other reasons	1	0.33	3.06	0.08	17.07	303.0-303.9	303.0-303.9
Cardio-vascular	All cardio-vascular	Active	15	15.76	0.95	0.53	1.57	390.0-459.9	390.0-459.9
Cardio-vascular	All cardio-vascular	Retired	53	56.86	0.93	0.70	1.22	390.0-459.9	390.0-459.9
Cardio-vascular	All cardio-vascular	Medical reasons	28	18.83	1.49	0.99	2.15	390.0-459.9	390.0-459.9
Cardio-vascular	All cardio-vascular	Other reasons	9	5.79	1.55	0.71	2.95	390.0-459.9	390.0-459.9
Cardio-vascular	IHD	Active	7	7.05	0.99	0.40	2.05	410.0-414.9	410.0-414.9
Cardio-vascular	IHD	Retired	16	23.26	0.69	0.39	1.12	410.0-414.9	410.0-414.9
Cardio-vascular	IHD	Medical reasons	9	7.9	1.14	0.52	2.16	410.0-414.9	410.0-414.9
Cardio-vascular	IHD	Other reasons	5	2.47	2.02	0.66	4.72	410.0-414.9	410.0-414.9
Non-malignant digestive diseases	Liver diseases	Active	13	7.23	1.80	0.96	3.07	571.0-571.9	571.0-571.9
Non-malignant digestive diseases	Liver diseases	Retired	12	10.26	1.17	0.60	2.04	571.0-571.9	571.0-571.9
Non-malignant digestive diseases	Liver diseases	Medical reasons	9	3.9	2.31	1.05	4.38	571.0-571.9	571.0-571.9

Non-malignant digestive diseases	Liver diseases	Other reasons	4	1.58	2.53	0.69	6.48	571.0-571.9	571.0-571.9
Non-malignant digestive diseases	Alcoholic liver diseases	Active	4	3.88	1.03	0.28	2.64	571	571.0-571.3
Non-malignant digestive diseases	Alcoholic liver diseases	Retired	9	5.64	1.60	0.73	3.03	571	571.0-571.3
Non-malignant digestive diseases	Alcoholic liver diseases	Medical reasons	3	2.16	1.39	0.29	4.05	571	571.0-571.3
Non-malignant digestive diseases	Alcoholic liver diseases	Other reasons	1	0.91	1.09	0.03	6.10	571	571.0-571.3
Non-malignant digestive diseases	Other liver diseases	Active	9	3.35	2.69	1.23	5.10	571.1-571.9	571.4-571.9
Non-malignant digestive diseases	Other liver diseases	Retired	3	4.62	0.65	0.13	1.90	571.1-571.9	571.4-571.9
Non-malignant digestive diseases	Other liver diseases	Medical reasons	6	1.74	3.45	1.26	7.51	571.1-571.9	571.4-571.9
Non-malignant digestive diseases	Other liver diseases	Other reasons	3	0.67	4.51	0.93	13.17	571.1-571.9	571.4-571.9
Violent causes	Suicides	Active	8	2.82	2.83	1.22	5.59	E950.0-E959.9	E950.0-E959.9
Violent causes	Suicides	Retired	5	1.62	3.08	1.00	7.20	E950.0-E959.9	E950.0-E959.9
Violent causes	Suicides	Medical reasons	2	0.63	3.17	0.38	11.43	E950.0-E959.9	E950.0-E959.9
Violent causes	Suicides	Other reasons	1	0.44	2.26	0.06	12.56	E950.0-E959.9	E950.0-E959.9
Infectious diseases	All infectious diseases except AIDS	Active	4	3.03	1.32	0.36	3.38		
Infectious diseases	All infectious diseases except AIDS	Retired	13	7.18	1.81	0.96	3.10		
Infectious diseases	All infectious diseases except AIDS	Medical reasons	3	2.38	1.26	0.26	3.69		
Infectious diseases	All infectious diseases except AIDS	Other reasons	5	0.82	6.13	1.99	14.30		
Non-malignant respiratory diseases	Infectious respiratory diseases	Active	0	0.99	0.00				
Non-malignant respiratory diseases	Infectious respiratory diseases	Retired	5	3.85	1.30	0.42	3.03		
Non-malignant respiratory diseases	Infectious respiratory diseases	Medical reasons	3	1.22	2.45	0.51	7.17		
Non-malignant respiratory diseases	Infectious respiratory diseases	Other reasons	2	0.39	5.17	0.63	18.67		
	All alcohol related diseases	Active	28	20.22	1.39	0.92	2.00		
	All alcohol related diseases	Retired	57	35.14	1.62	1.23	2.10		
	All alcohol related diseases	Medical reasons	24	13.4	1.79	1.15	2.67		
	All alcohol related diseases	Other reasons	13	5.2	2.50	1.33	4.28		

Mortality by detailed duration of work as a sewage worker for selected causes, all subjects.									
disease group	cause	Duration	observed	expected	smr	CI95_inf	CI95_sup	icd8	icd9
	All causes	0	4	3	1.33	0.36	3.42	1-999.9	1-999.9
	All causes	1	17	10.17	1.67	0.97	2.68	1-999.9	1-999.9
	All causes	5	30	20.09	1.49	1.01	2.13	1-999.9	1-999.9
	All causes	10	55	49.05	1.12	0.84	1.46	1-999.9	1-999.9
	All causes	15	152	126.18	1.20	1.02	1.41	1-999.9	1-999.9
	All causes	20	195	159.88	1.22	1.05	1.40	1-999.9	1-999.9
	All causes	25	77	55.29	1.39	1.10	1.74	1-999.9	1-999.9
Infectious diseases	Infectious diseases Ch I except AIDS	0	0	0.04	0.00			1.0-139.9	1.0-139.9 exc. 41.0-45.0
Infectious diseases	Infectious diseases Ch I except AIDS	1	0	0.15	0.00			1.0-139.9	1.0-139.9 exc. 41.0-45.0
Infectious diseases	Infectious diseases Ch I except AIDS	5	0	0.32	0.00			1.0-139.9	1.0-139.9 exc. 41.0-45.0
Infectious diseases	Infectious diseases Ch I except AIDS	10	1	0.75	1.34	0.03	7.47	1.0-139.9	1.0-139.9 exc. 41.0-45.0
Infectious diseases	Infectious diseases Ch I except AIDS	15	2	1.74	1.15	0.14	4.16	1.0-139.9	1.0-139.9 exc. 41.0-45.0
Infectious diseases	Infectious diseases Ch I except AIDS	20	6	2.05	2.93	1.07	6.37	1.0-139.9	1.0-139.9 exc. 41.0-45.0
Infectious diseases	Infectious diseases Ch I except AIDS	25	1	0.7	1.43	0.04	7.98	1.0-139.9	1.0-139.9 exc. 41.0-45.0
Malignant diseases	All cancers	0	0	0.66	0.00			140.0-209.9	140.0-208.9
Malignant diseases	All cancers	1	4	2.54	1.57	0.43	4.03	140.0-209.9	140.0-208.9
Malignant diseases	All cancers	5	10	6.17	1.62	0.78	2.98	140.0-209.9	140.0-208.9
Malignant diseases	All cancers	10	21	18.12	1.16	0.72	1.77	140.0-209.9	140.0-208.9
Malignant diseases	All cancers	15	71	51.11	1.39	1.09	1.75	140.0-209.9	140.0-208.9
Malignant diseases	All cancers	20	85	68.49	1.24	0.99	1.53	140.0-209.9	140.0-208.9
Malignant diseases	All cancers	25	44	23.97	1.84	1.33	2.46	140.0-209.9	140.0-208.9
Malignant diseases	Head and neck 1	0	0	0.1	0.00			140.0-149.9, 161.0-161.9	140.0-149.9, 161.0-161.9
Malignant diseases	Head and neck 1	1	3	0.4	7.41	1.53	21.66	140.0-149.9, 161.0-161.9	140.0-149.9, 161.0-161.9
Malignant diseases	Head and neck 1	5	2	1.15	1.73	0.21	6.26	140.0-149.9, 161.0-161.9	140.0-149.9, 161.0-161.9
Malignant diseases	Head and neck 1	10	3	3.18	0.94	0.19	2.75	140.0-149.9, 161.0-161.9	140.0-149.9, 161.0-161.9
Malignant diseases	Head and neck 1	15	11	7.71	1.43	0.71	2.55	140.0-149.9, 161.0-161.9	140.0-149.9, 161.0-161.9

Malignant diseases	Head and neck 1	20	8	9.26	0.86	0.37	1.70	140.0-149.9, 161.0-161.9	140.0-149.9, 161.0-161.9
Malignant diseases	Head and neck 1	25	8	3.22	2.49	1.07	4.90	140.0-149.9, 161.0-161.9	140.0-149.9, 161.0-161.9
Malignant diseases	Head and neck 2	0	0	0.13	0.00			140.0-149.9, 160.2-161.9	140.0-149.9, 160.2-161.9
Malignant diseases	Head and neck 2	1	3	0.49	6.13	1.26	17.91	140.0-149.9, 160.2-161.9	140.0-149.9, 160.2-161.9
Malignant diseases	Head and neck 2	5	2	1.35	1.48	0.18	5.35	140.0-149.9, 160.2-161.9	140.0-149.9, 160.2-161.9
Malignant diseases	Head and neck 2	10	3	3.67	0.82	0.17	2.39	140.0-149.9, 160.2-161.9	140.0-149.9, 160.2-161.9
Malignant diseases	Head and neck 2	15	14	9.06	1.55	0.84	2.59	140.0-149.9, 160.2-161.9	140.0-149.9, 160.2-161.9
Malignant diseases	Head and neck 2	20	12	11.32	1.06	0.55	1.85	140.0-149.9, 160.2-161.9	140.0-149.9, 160.2-161.9
Malignant diseases	Head and neck 2	25	9	3.97	2.27	1.04	4.30	140.0-149.9, 160.2-161.9	140.0-149.9, 160.2-161.9
Malignant diseases	Oesophagus	0	0	0.04	0.00			150.0-150.9	150.0-150.9
Malignant diseases	Oesophagus	1	1	0.16	6.23	0.16	34.72	150.0-150.9	150.0-150.9
Malignant diseases	Oesophagus	5	1	0.46	2.20	0.05	12.24	150.0-150.9	150.0-150.9
Malignant diseases	Oesophagus	10	2	1.3	1.53	0.19	5.54	150.0-150.9	150.0-150.9
Malignant diseases	Oesophagus	15	3	3.36	0.89	0.18	2.61	150.0-150.9	150.0-150.9
Malignant diseases	Oesophagus	20	11	4.3	2.56	1.27	4.58	150.0-150.9	150.0-150.9
Malignant diseases	Oesophagus	25	4	1.53	2.62	0.71	6.69	150.0-150.9	150.0-150.9
Malignant diseases	Liver	0	0	0.03	0.00			155.0-155.9	155.0-155.9
Malignant diseases	Liver	1	0	0.12	0.00			155.0-155.9	155.0-155.9
Malignant diseases	Liver	5	0	0.26	0.00			155.0-155.9	155.0-155.9
Malignant diseases	Liver	10	2	0.79	2.52	0.31	9.11	155.0-155.9	155.0-155.9
Malignant diseases	Liver	15	6	2.46	2.44	0.89	5.31	155.0-155.9	155.0-155.9
Malignant diseases	Liver	20	5	3.69	1.36	0.44	3.16	155.0-155.9	155.0-155.9
Malignant diseases	Liver	25	3	1.3	2.31	0.47	6.74	155.0-155.9	155.0-155.9
Malignant diseases	Nasal cavity and sinuses	0	0	0.03	0.00			160.0-160.9	160.0-160.9
Malignant diseases	Nasal cavity and sinuses	1	0	0.09	0.00			160.0-160.9	160.0-160.9
Malignant diseases	Nasal cavity and sinuses	5	0	0.2	0.00			160.0-160.9	160.0-160.9
Malignant diseases	Nasal cavity and sinuses	10	0	0.49	0.00			160.0-160.9	160.0-160.9
Malignant diseases	Nasal cavity and sinuses	15	3	1.35	2.22	0.46	6.49	160.0-160.9	160.0-160.9
Malignant diseases	Nasal cavity and sinuses	20	4	2.06	1.94	0.53	4.96	160.0-160.9	160.0-160.9
Malignant diseases	Nasal cavity and sinuses	25	1	0.75	1.33	0.03	7.42	160.0-160.9	160.0-160.9
Malignant diseases	Larynx	0	0	0.03	0.00			161.0-161.9	161.0-161.9
Malignant diseases	Larynx	1	0	0.13	0.00			161.0-161.9	161.0-161.9

Malignant diseases	Larynx	5	1	0.4	2.52	0.06	14.05	161.0-161.9	161.0-161.9
Malignant diseases	Larynx	10	1	1.19	0.84	0.02	4.67	161.0-161.9	161.0-161.9
Malignant diseases	Larynx	15	3	2.95	1.02	0.21	2.97	161.0-161.9	161.0-161.9
Malignant diseases	Larynx	20	1	3.42	0.29	0.01	1.63	161.0-161.9	161.0-161.9
Malignant diseases	Larynx	25	4	1.16	3.45	0.94	8.84	161.0-161.9	161.0-161.9
Malignant diseases	Lung	0	0	0.16	0.00			162.0-162.9	162.0-162.9
Malignant diseases	Lung	1	0	0.62	0.00			162.0-162.9	162.0-162.9
Malignant diseases	Lung	5	5	1.57	3.18	1.03	7.43	162.0-162.9	162.0-162.9
Malignant diseases	Lung	10	4	4.72	0.85	0.23	2.17	162.0-162.9	162.0-162.9
Malignant diseases	Lung	15	19	13.6	1.40	0.84	2.18	162.0-162.9	162.0-162.9
Malignant diseases	Lung	20	27	18.9	1.43	0.94	2.08	162.0-162.9	162.0-162.9
Malignant diseases	Lung	25	13	6.69	1.94	1.03	3.32	162.0-162.9	162.0-162.9
Malignant diseases	Brain	0	0	0.02	0.00			191.0-191.9	191.0-191.9
Malignant diseases	Brain	1	0	0.08	0.00			191.0-191.9	191.0-191.9
Malignant diseases	Brain	5	0	0.16	0.00			191.0-191.9	191.0-191.9
Malignant diseases	Brain	10	0	0.32	0.00			191.0-191.9	191.0-191.9
Malignant diseases	Brain	15	1	0.73	1.37	0.03	7.66	191.0-191.9	191.0-191.9
Malignant diseases	Brain	20	3	0.94	3.19	0.66	9.32	191.0-191.9	191.0-191.9
Malignant diseases	Brain	25	1	0.33	3.03	0.08	16.89	191.0-191.9	191.0-191.9
Endocrine diseases	All endocrine	0	0	0.03	0.00			240.0-279.9	240.0-279.9
Endocrine diseases	All endocrine	1	0	0.11	0.00			240.0-279.9	240.0-279.9
Endocrine diseases	All endocrine	5	1	0.25	4.00	0.10	22.30	240.0-279.9	240.0-279.9
Endocrine diseases	All endocrine	10	0	0.64	0.00			240.0-279.9	240.0-279.9
Endocrine diseases	All endocrine	15	3	1.85	1.62	0.33	4.73	240.0-279.9	240.0-279.9
Endocrine diseases	All endocrine	20	3	2.4	1.25	0.26	3.65	240.0-279.9	240.0-279.9
Endocrine diseases	All endocrine	25	3	0.83	3.63	0.75	10.60	240.0-279.9	240.0-279.9
Mental diseases	All mental diseases	0	0	0.06	0.00			290.0-315.9	290.0-319.9
Mental diseases	All mental diseases	1	2	0.2	9.97	1.21	36.00	290.0-315.9	290.0-319.9
Mental diseases	All mental diseases	5	1	0.42	2.39	0.06	13.33	290.0-315.9	290.0-319.9
Mental diseases	All mental diseases	10	1	0.9	1.11	0.03	6.19	290.0-315.9	290.0-319.9
Mental diseases	All mental diseases	15	5	1.96	2.55	0.83	5.96	290.0-315.9	290.0-319.9
Mental diseases	All mental diseases	20	5	2.26	2.21	0.72	5.15	290.0-315.9	290.0-319.9
Mental diseases	All mental diseases	25	1	0.77	1.30	0.03	7.23	290.0-315.9	290.0-319.9
Mental diseases	Alcoholic dependence	0	0	0.04	0.00			303.0-303.9	303.0-303.9
Mental diseases	Alcoholic dependence	1	0	0.12	0.00			303.0-303.9	303.0-303.9
Mental diseases	Alcoholic dependence	5	1	0.29	3.47	0.09	19.31	303.0-303.9	303.0-303.9
Mental diseases	Alcoholic dependence	10	1	0.62	1.62	0.04	9.02	303.0-303.9	303.0-303.9
Mental diseases	Alcoholic dependence	15	2	1.28	1.56	0.19	5.62	303.0-303.9	303.0-303.9
Mental diseases	Alcoholic dependence	20	3	1.46	2.06	0.42	6.02	303.0-303.9	303.0-303.9
Mental diseases	Alcoholic dependence	25	1	0.49	2.02	0.05	11.28	303.0-303.9	303.0-303.9
Cardio-vascular	All cardio-vascular	0	2	0.33	6.12	0.74	22.09	390.0-459.9	390.0-459.9

Cardio-vascular	All cardio-vascular	1	2	1.3	1.54	0.19	5.57	390.0-459.9	390.0-459.9
Cardio-vascular	All cardio-vascular	5	5	3.06	1.63	0.53	3.82	390.0-459.9	390.0-459.9
Cardio-vascular	All cardio-vascular	10	8	9.91	0.81	0.35	1.59	390.0-459.9	390.0-459.9
Cardio-vascular	All cardio-vascular	15	28	30.17	0.93	0.62	1.34	390.0-459.9	390.0-459.9
Cardio-vascular	All cardio-vascular	20	44	39.08	1.13	0.82	1.51	390.0-459.9	390.0-459.9
Cardio-vascular	All cardio-vascular	25	16	13.41	1.19	0.68	1.94	390.0-459.9	390.0-459.9
Cardio-vascular	IHD	0	0	0.13	0.00			410.0-414.9	410.0-414.9
Cardio-vascular	IHD	1	2	0.52	3.87	0.47	13.97	410.0-414.9	410.0-414.9
Cardio-vascular	IHD	5	2	1.29	1.54	0.19	5.58	410.0-414.9	410.0-414.9
Cardio-vascular	IHD	10	3	4.23	0.71	0.15	2.07	410.0-414.9	410.0-414.9
Cardio-vascular	IHD	15	10	12.63	0.79	0.38	1.46	410.0-414.9	410.0-414.9
Cardio-vascular	IHD	20	16	16.29	0.98	0.56	1.60	410.0-414.9	410.0-414.9
Cardio-vascular	IHD	25	4	5.59	0.72	0.19	1.83	410.0-414.9	410.0-414.9
Non-malignant digestive diseases	Liver diseases	0	0	0.13	0.00			571.0-571.9	571.0-571.9
Non-malignant digestive diseases	Liver diseases	1	0	0.48	0.00			571.0-571.9	571.0-571.9
Non-malignant digestive diseases	Liver diseases	5	2	1.25	1.61	0.19	5.80	571.0-571.9	571.0-571.9
Non-malignant digestive diseases	Liver diseases	10	6	3.13	1.91	0.70	4.17	571.0-571.9	571.0-571.9
Non-malignant digestive diseases	Liver diseases	15	12	7.05	1.70	0.88	2.97	571.0-571.9	571.0-571.9
Non-malignant digestive diseases	Liver diseases	20	14	8.1	1.73	0.94	2.90	571.0-571.9	571.0-571.9
Non-malignant digestive diseases	Liver diseases	25	4	2.83	1.41	0.38	3.62	571.0-571.9	571.0-571.9
Non-malignant digestive diseases	Alcoholic liver diseases	0	0	0.08	0.00			571	571.0-571.3
Non-malignant digestive diseases	Alcoholic liver diseases	1	0	0.28	0.00			571	571.0-571.3
Non-malignant digestive diseases	Alcoholic liver diseases	5	1	0.71	1.42	0.04	7.88	571	571.0-571.3
Non-malignant digestive diseases	Alcoholic liver diseases	10	0	1.71	0.00			571	571.0-571.3
Non-malignant digestive diseases	Alcoholic liver diseases	15	5	3.78	1.32	0.43	3.09	571	571.0-571.3
Non-malignant digestive diseases	Alcoholic liver diseases	20	7	4.48	1.56	0.63	3.22	571	571.0-571.3
Non-malignant digestive diseases	Alcoholic liver diseases	25	4	1.57	2.54	0.69	6.51	571	571.0-571.3
Non-malignant digestive diseases	Other liver diseases	0	0	0.05	0.00			571.1-571.9	571.4-571.9
Non-malignant digestive diseases	Other liver diseases	1	0	0.21	0.00			571.1-571.9	571.4-571.9
Non-malignant digestive diseases	Other liver diseases	5	1	0.54	1.86	0.05	10.34	571.1-571.9	571.4-571.9
Non-malignant digestive diseases	Other liver diseases	10	6	1.43	4.21	1.54	9.13	571.1-571.9	571.4-571.9
Non-malignant digestive diseases	Other liver diseases	15	7	3.27	2.14	0.86	4.41	571.1-571.9	571.4-571.9
Non-malignant digestive diseases	Other liver diseases	20	7	3.62	1.93	0.78	3.98	571.1-571.9	571.4-571.9
Non-malignant digestive diseases	Other liver diseases	25	0	1.26	0.00			571.1-571.9	571.4-571.9
Violent causes	Suicides	0	0	0.15	0.00			E950.0-E959.9	E950.0-E959.9
Violent causes	Suicides	1	1	0.46	2.16	0.05	12.06	E950.0-E959.9	E950.0-E959.9
Violent causes	Suicides	5	3	0.69	4.35	0.90	12.72	E950.0-E959.9	E950.0-E959.9
Violent causes	Suicides	10	5	0.95	5.28	1.72	12.32	E950.0-E959.9	E950.0-E959.9
Violent causes	Suicides	15	3	1.44	2.09	0.43	6.10	E950.0-E959.9	E950.0-E959.9
Violent causes	Suicides	20	3	1.38	2.18	0.45	6.36	E950.0-E959.9	E950.0-E959.9
Violent causes	Suicides	25	1	0.46	2.20	0.05	12.23	E950.0-E959.9	E950.0-E959.9

Infectious diseases	All infectious diseases except AIDS	0	1	0.08	12.93	0.32	72.02		
Infectious diseases	All infectious diseases except AIDS	1	2	0.3	6.63	0.80	23.96		
Infectious diseases	All infectious diseases except AIDS	5	0	0.64	0.00				
Infectious diseases	All infectious diseases except AIDS	10	1	1.59	0.63	0.02	3.52		
Infectious diseases	All infectious diseases except AIDS	15	8	4.05	1.97	0.85	3.89		
Infectious diseases	All infectious diseases except AIDS	20	11	5.03	2.18	1.09	3.91		
Infectious diseases	All infectious diseases except AIDS	25	2	1.72	1.17	0.14	4.21		
Non-malignant respiratory diseases	Infectious respiratory diseases	0	0	0.03	0.00				
Non-malignant respiratory diseases	Infectious respiratory diseases	1	1	0.11	9.38	0.23	52.27		
Non-malignant respiratory diseases	Infectious respiratory diseases	5	0	0.23	0.00				
Non-malignant respiratory diseases	Infectious respiratory diseases	10	0	0.66	0.00				
Non-malignant respiratory diseases	Infectious respiratory diseases	15	4	1.93	2.07	0.56	5.30		
Non-malignant respiratory diseases	Infectious respiratory diseases	20	4	2.6	1.54	0.42	3.93		
Non-malignant respiratory diseases	Infectious respiratory diseases	25	1	0.89	1.13	0.03	6.28		
	All alcohol related diseases	0	0	0.36	0.00				
	All alcohol related diseases	1	4	1.36	2.94	0.80	7.52		
	All alcohol related diseases	5	6	3.56	1.69	0.62	3.67		
	All alcohol related diseases	10	15	9.34	1.61	0.90	2.65		
	All alcohol related diseases	15	35	22.42	1.56	1.09	2.17		
	All alcohol related diseases	20	42	27.35	1.54	1.11	2.08		
	All alcohol related diseases	25	20	9.56	2.09	1.28	3.23		

Mortality by summarized duration of work as a sewage worker for selected causes, all subjects									
disease group	cause	Duration	observed	expected	smr	CI95_in	CI95_su	icd8	icd9
	All causes	0	51	33.26	1.53	1.14	2.02	1-999.9	1-999.9
	All causes	10	207	175.23	1.18	1.03	1.35	1-999.9	1-999.9
	All causes	20	272	215.16	1.26	1.12	1.42	1-999.9	1-999.9
Infectious diseases	Infectious diseases Ch I except AIDS	0	0	0.51	0.00			1.0-139.9	1.0-139.9 exc. 41.0-45.0
Infectious diseases	Infectious diseases Ch I except AIDS	10	3	2.48	1.21	0.25	3.53	1.0-139.9	1.0-139.9 exc. 41.0-45.0
Infectious diseases	Infectious diseases Ch I except AIDS	20	7	2.75	2.55	1.02	5.24	1.0-139.9	1.0-139.9 exc. 41.0-45.0
Malignant diseases	All cancers	0	14	9.37	1.49	0.82	2.51	140.0-209.9	140.0-208.9
Malignant diseases	All cancers	10	92	69.23	1.33	1.07	1.63	140.0-209.9	140.0-208.9
Malignant diseases	All cancers	20	129	92.46	1.40	1.16	1.66	140.0-209.9	140.0-208.9
Malignant diseases	Head and neck 1	0	5	1.66	3.01	0.98	7.03	140.0-149.9, 161.0-161.9	140.0-149.9, 161.0-161.9
Malignant diseases	Head and neck 1	10	14	10.89	1.29	0.70	2.16	140.0-149.9, 161.0-161.9	140.0-149.9, 161.0-161.9
Malignant diseases	Head and neck 1	20	16	12.48	1.28	0.73	2.08	140.0-149.9, 161.0-161.9	140.0-149.9, 161.0-161.9
Malignant diseases	Head and neck 2	0	5	1.97	2.54	0.83	5.93	140.0-149.9, 160.2-161.9	140.0-149.9, 160.2-161.9
Malignant diseases	Head and neck 2	10	17	12.73	1.34	0.78	2.14	140.0-149.9, 160.2-161.9	140.0-149.9, 160.2-161.9
Malignant diseases	Head and neck 2	20	21	15.29	1.37	0.85	2.10	140.0-149.9, 160.2-161.9	140.0-149.9, 160.2-161.9
Malignant diseases	Oesophagus	0	2	0.66	3.05	0.37	11.01	150.0-150.9	150.0-150.9
Malignant diseases	Oesophagus	10	5	4.67	1.07	0.35	2.50	150.0-150.9	150.0-150.9
Malignant diseases	Oesophagus	20	15	5.83	2.57	1.44	4.24	150.0-150.9	150.0-150.9
Malignant diseases	Liver	0	0	0.42	0.00			155.0-155.9	155.0-155.9
Malignant diseases	Liver	10	8	3.25	2.46	1.06	4.85	155.0-155.9	155.0-155.9
Malignant diseases	Liver	20	8	4.99	1.60	0.69	3.16	155.0-155.9	155.0-155.9
Malignant diseases	Nasal cavity and sinuses	0	0	0.31	0.00			160.0-160.9	160.0-160.9
Malignant diseases	Nasal cavity and sinuses	10	3	1.84	1.63	0.34	4.76	160.0-160.9	160.0-160.9
Malignant diseases	Nasal cavity and sinuses	20	5	2.82	1.78	0.58	4.14	160.0-160.9	160.0-160.9
Malignant diseases	Larynx	0	1	0.56	1.80	0.05	10.04	161.0-161.9	161.0-161.9
Malignant diseases	Larynx	10	4	4.15	0.96	0.26	2.47	161.0-161.9	161.0-161.9
Malignant diseases	Larynx	20	5	4.58	1.09	0.35	2.55	161.0-161.9	161.0-161.9
Malignant diseases	Lung	0	5	2.35	2.13	0.69	4.96	162.0-162.9	162.0-162.9
Malignant diseases	Lung	10	23	18.32	1.26	0.80	1.88	162.0-162.9	162.0-162.9

Malignant diseases	Lung	20	40	25.59	1.56	1.12	2.13	162.0-162.9	162.0-162.9
Malignant diseases	Brain	0	0	0.26	0.00			191.0-191.9	191.0-191.9
Malignant diseases	Brain	10	1	1.05	0.95	0.02	5.31	191.0-191.9	191.0-191.9
Malignant diseases	Brain	20	4	1.27	3.15	0.86	8.06	191.0-191.9	191.0-191.9
Endocrine diseases	All endocrine	0	1	0.4	2.51	0.06	14.01	240.0-279.9	240.0-279.9
Endocrine diseases	All endocrine	10	3	2.49	1.20	0.25	3.52	240.0-279.9	240.0-279.9
Endocrine diseases	All endocrine	20	6	3.23	1.86	0.68	4.04	240.0-279.9	240.0-279.9
Mental diseases	All mental diseases	0	3	0.68	4.39	0.90	12.83	290.0-315.9	290.0-319.9
Mental diseases	All mental diseases	10	6	2.86	2.10	0.77	4.57	290.0-315.9	290.0-319.9
Mental diseases	All mental diseases	20	6	3.04	1.98	0.72	4.30	290.0-315.9	290.0-319.9
Mental diseases	Alcoholic dependence	0	1	0.45	2.23	0.06	12.41	303.0-303.9	303.0-303.9
Mental diseases	Alcoholic dependence	10	3	1.9	1.58	0.32	4.61	303.0-303.9	303.0-303.9
Mental diseases	Alcoholic dependence	20	4	1.95	2.05	0.56	5.25	303.0-303.9	303.0-303.9
Cardio-vascular	All cardio-vascular	0	9	4.68	1.92	0.88	3.65	390.0-459.9	390.0-459.9
Cardio-vascular	All cardio-vascular	10	36	40.08	0.90	0.63	1.24	390.0-459.9	390.0-459.9
Cardio-vascular	All cardio-vascular	20	60	52.49	1.14	0.87	1.47	390.0-459.9	390.0-459.9
Cardio-vascular	IHD	0	4	1.94	2.06	0.56	5.27	410.0-414.9	410.0-414.9
Cardio-vascular	IHD	10	13	16.86	0.77	0.41	1.32	410.0-414.9	410.0-414.9
Cardio-vascular	IHD	20	20	21.88	0.91	0.56	1.41	410.0-414.9	410.0-414.9
Non-malignant digestive diseases	Liver diseases	0	2	1.86	1.08	0.13	3.89	571.0-571.9	571.0-571.9
Non-malignant digestive diseases	Liver diseases	10	18	10.18	1.77	1.05	2.79	571.0-571.9	571.0-571.9
Non-malignant digestive diseases	Liver diseases	20	18	10.93	1.65	0.98	2.60	571.0-571.9	571.0-571.9
Non-malignant digestive diseases	Alcoholic liver diseases	0	1	1.06	0.94	0.02	5.25	571	571.0-571.3
Non-malignant digestive diseases	Alcoholic liver diseases	10	5	5.49	0.91	0.30	2.13	571	571.0-571.3
Non-malignant digestive diseases	Alcoholic liver diseases	20	11	6.05	1.82	0.91	3.25	571	571.0-571.3
Non-malignant digestive diseases	Other liver diseases	0	1	0.79	1.26	0.03	7.01	571.1-571.9	571.4-571.9
Non-malignant digestive diseases	Other liver diseases	10	13	4.7	2.77	1.47	4.73	571.1-571.9	571.4-571.9
Non-malignant digestive diseases	Other liver diseases	20	7	4.88	1.44	0.57	2.96	571.1-571.9	571.4-571.9
Violent causes	Suicides	0	4	1.3	3.07	0.83	7.85	E950.0-E959.9	E950.0-E959.9
Violent causes	Suicides	10	8	2.38	3.36	1.45	6.62	E950.0-E959.9	E950.0-E959.9
Violent causes	Suicides	20	4	1.83	2.18	0.59	5.58	E950.0-E959.9	E950.0-E959.9
Infectious diseases	All infectious diseases except AIDS	0	3	1.01	2.96	0.61	8.64		
Infectious diseases	All infectious diseases except AIDS	10	9	5.64	1.60	0.73	3.03		
Infectious diseases	All infectious diseases except AIDS	20	13	6.75	1.93	1.02	3.29		
Non-malignant respiratory diseases	Infectious respiratory diseases	0	1	0.37	2.73	0.07	15.19		
Non-malignant respiratory diseases	Infectious respiratory diseases	10	4	2.59	1.54	0.42	3.95		
Non-malignant respiratory diseases	Infectious respiratory diseases	20	5	3.49	1.43	0.47	3.34		
	All alcohol related diseases	0	10	5.28	1.89	0.91	3.48		
	All alcohol related diseases	10	50	31.77	1.57	1.17	2.07		
	All alcohol related diseases	20	62	36.91	1.68	1.29	2.15		

Mortality by summarized duration of work as a sewage worker for selected causes, after exclusion of all workers having left for other reasons.									
disease group	cause	Duration	observed	expected	smr	CI95_inf	CI95_sup	icd8	icd9
	All causes	0	27	23.19	1.16	0.77	1.69	1-999.9	1-999.9
	All causes	10	186	162.61	1.14	0.99	1.32	1-999.9	1-999.9
	All causes	20	267	209.65	1.27	1.13	1.44	1-999.9	1-999.9
Infectious diseases	Infectious diseases Ch I except AIDS	0	0	0.39	0.00			1.0-139.9	1.0-139.9 exc. 41.0-45.0
Infectious diseases	Infectious diseases Ch I except AIDS	10	3	2.32	1.29	0.27	3.77	1.0-139.9	1.0-139.9 exc. 41.0-45.0
Infectious diseases	Infectious diseases Ch I except AIDS	20	7	2.67	2.62	1.05	5.40	1.0-139.9	1.0-139.9 exc. 41.0-45.0
Malignant diseases	All cancers	0	5	5.67	0.88	0.29	2.06	140.0-209.9	140.0-208.9
Malignant diseases	All cancers	10	81	63.69	1.27	1.01	1.58	140.0-209.9	140.0-208.9
Malignant diseases	All cancers	20	128	90.11	1.42	1.19	1.69	140.0-209.9	140.0-208.9
Malignant diseases	Head and neck 1	0	2	1.02	1.96	0.24	7.09	140.0-149.9, 161.0-161.9	140.0-149.9, 161.0-161.9
Malignant diseases	Head and neck 1	10	13	10.03	1.30	0.69	2.22	140.0-149.9, 161.0-161.9	140.0-149.9, 161.0-161.9
Malignant diseases	Head and neck 1	20	16	12.21	1.31	0.75	2.13	140.0-149.9, 161.0-161.9	140.0-149.9, 161.0-161.9
Malignant diseases	Head and neck 2	0	2	1.17	1.71	0.21	6.17	140.0-149.9, 160.2-161.9	140.0-149.9, 160.2-161.9
Malignant diseases	Head and neck 2	10	16	11.68	1.37	0.78	2.22	140.0-149.9, 160.2-161.9	140.0-149.9, 160.2-161.9
Malignant diseases	Head and neck 2	20	21	14.96	1.40	0.87	2.15	140.0-149.9, 160.2-161.9	140.0-149.9, 160.2-161.9
Malignant diseases	Oesophagus	0	0	0.39	0.00			150.0-150.9	150.0-150.9
Malignant diseases	Oesophagus	10	3	4.29	0.70	0.14	2.05	150.0-150.9	150.0-150.9
Malignant diseases	Oesophagus	20	15	5.7	2.63	1.47	4.34	150.0-150.9	150.0-150.9
Malignant diseases	Liver	0	0	0.23	0.00			155.0-155.9	155.0-155.9
Malignant diseases	Liver	10	8	2.96	2.71	1.17	5.33	155.0-155.9	155.0-155.9
Malignant diseases	Liver	20	8	4.86	1.65	0.71	3.24	155.0-155.9	155.0-155.9
Malignant diseases	Nasal cavity and sinuses	0	0	0.15	0.00			160.0-160.9	160.0-160.9
Malignant diseases	Nasal cavity and sinuses	10	3	1.66	1.81	0.37	5.29	160.0-160.9	160.0-160.9
Malignant diseases	Nasal cavity and sinuses	20	5	2.76	1.81	0.59	4.23	160.0-160.9	160.0-160.9
Malignant diseases	Larynx	0	1	0.35	2.82	0.07	15.71	161.0-161.9	161.0-161.9
Malignant diseases	Larynx	10	4	3.83	1.04	0.28	2.67	161.0-161.9	161.0-161.9
Malignant diseases	Larynx	20	5	4.48	1.12	0.36	2.61	161.0-161.9	161.0-161.9
Malignant diseases	Lung	0	1	1.32	0.76	0.02	4.23	162.0-162.9	162.0-162.9
Malignant diseases	Lung	10	19	16.76	1.13	0.68	1.77	162.0-162.9	162.0-162.9

Malignant diseases	Lung	20	40	24.95	1.60	1.15	2.18	162.0-162.9	162.0-162.9
Malignant diseases	Brain	0	0	0.18	0.00			191.0-191.9	191.0-191.9
Malignant diseases	Brain	10	1	0.97	1.03	0.03	5.77	191.0-191.9	191.0-191.9
Malignant diseases	Brain	20	4	1.24	3.23	0.88	8.26	191.0-191.9	191.0-191.9
Endocrine diseases	All endocrine	0	1	0.27	3.65	0.09	20.36	240.0-279.9	240.0-279.9
Endocrine diseases	All endocrine	10	2	2.32	0.86	0.10	3.12	240.0-279.9	240.0-279.9
Endocrine diseases	All endocrine	20	6	3.14	1.91	0.70	4.16	240.0-279.9	240.0-279.9
Mental diseases	All mental diseases	0	2	0.48	4.18	0.51	15.08	290.0-315.9	290.0-319.9
Mental diseases	All mental diseases	10	5	2.66	1.88	0.61	4.38	290.0-315.9	290.0-319.9
Mental diseases	All mental diseases	20	6	2.97	2.02	0.74	4.40	290.0-315.9	290.0-319.9
Mental diseases	Alcoholic dependence	0	1	0.3	3.29	0.08	18.31	303.0-303.9	303.0-303.9
Mental diseases	Alcoholic dependence	10	2	1.76	1.14	0.14	4.10	303.0-303.9	303.0-303.9
Mental diseases	Alcoholic dependence	20	4	1.91	2.09	0.57	5.36	303.0-303.9	303.0-303.9
Cardio-vascular	All cardio-vascular	0	4	3.05	1.31	0.36	3.36	390.0-459.9	390.0-459.9
Cardio-vascular	All cardio-vascular	10	34	37.34	0.91	0.63	1.27	390.0-459.9	390.0-459.9
Cardio-vascular	All cardio-vascular	20	58	51.06	1.14	0.86	1.47	390.0-459.9	390.0-459.9
Cardio-vascular	IHD	0	2	1.24	1.61	0.19	5.81	410.0-414.9	410.0-414.9
Cardio-vascular	IHD	10	11	15.67	0.70	0.35	1.26	410.0-414.9	410.0-414.9
Cardio-vascular	IHD	20	19	21.29	0.89	0.54	1.39	410.0-414.9	410.0-414.9
Non-malignant digestive diseases	Liver diseases	0	1	1.27	0.79	0.02	4.39	571.0-571.9	571.0-571.9
Non-malignant digestive diseases	Liver diseases	10	15	9.44	1.59	0.89	2.62	571.0-571.9	571.0-571.9
Non-malignant digestive diseases	Liver diseases	20	18	10.68	1.69	1.00	2.66	571.0-571.9	571.0-571.9
Non-malignant digestive diseases	Alcoholic liver diseases	0	0	0.7	0.00			571	571.0-571.3
Non-malignant digestive diseases	Alcoholic liver diseases	10	5	5.07	0.99	0.32	2.30	571	571.0-571.3
Non-malignant digestive diseases	Alcoholic liver diseases	20	11	5.92	1.86	0.93	3.32	571	571.0-571.3
Non-malignant digestive diseases	Other liver diseases	0	1	0.57	1.75	0.04	9.75	571.1-571.9	571.4-571.9
Non-malignant digestive diseases	Other liver diseases	10	10	4.37	2.29	1.10	4.21	571.1-571.9	571.4-571.9
Non-malignant digestive diseases	Other liver diseases	20	7	4.76	1.47	0.59	3.03	571.1-571.9	571.4-571.9
Violent causes	Suicides	0	3	1.04	2.89	0.59	8.43	E950.0-E959.9	E950.0-E959.9
Violent causes	Suicides	10	8	2.24	3.57	1.54	7.04	E950.0-E959.9	E950.0-E959.9
Violent causes	Suicides	20	4	1.8	2.23	0.61	5.70	E950.0-E959.9	E950.0-E959.9
Infectious diseases	All infectious diseases except AIDS	0	0	0.75	0.00				
Infectious diseases	All infectious diseases except AIDS	10	8	5.27	1.52	0.65	2.99		
Infectious diseases	All infectious diseases except AIDS	20	12	6.57	1.83	0.94	3.19		
Non-malignant respiratory diseases	Infectious respiratory diseases	0	0	0.25	0.00				
Non-malignant respiratory diseases	Infectious respiratory diseases	10	4	2.42	1.66	0.45	4.24		
Non-malignant respiratory diseases	Infectious respiratory diseases	20	4	3.4	1.18	0.32	3.01		
	All alcohol related diseases	0	4	3.4	1.18	0.32	3.01		
	All alcohol related diseases	10	43	29.29	1.47	1.06	1.98		
	All alcohol related diseases	20	62	36.06	1.72	1.32	2.20		