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Apparent decreases in Swedish public health indicators after 1997—Are they due to improved diagnostics or to environmental factors?

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Abstract

The object of this work was to review recent trends in public health in Sweden. Data on different adverse health indicators were collected from official Swedish registries. We found that population health generally improved during the early 1990s but suddenly started to deteriorate from 1997 onwards. This quite dramatic change is not likely to be explained only by improved diagnostics but physical causes need immediately to be searched for. A connection with the increasing exposure of the population to GHz radiation from mobile phones, base stations and other communication technologies cannot be ruled out.

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1. Introduction

During the first half of the 1990s, the Swedish population appeared increasingly healthy. Sick leave registrations decreased; in addition, lung cancer among older men steadily decreased and the incidence of prostate cancer levelled out, becoming stable or slightly decreasing between 1993 and 1997. In Stockholm, even the number of traffic accidents with injuries went down each year from 1985 to 1996. Mortality due to Alzheimer's disease increased in the early 1980s, but remained steady at 2.5–4 per 100,000 person-years (age standardized) from 1990 to 1997.

Objective of the present study: After 1997, public health appeared to decline markedly. Was this decrease the result of improvements in detection and diagnosis, or did maladies actually increase? In this paper, we take a look at several health trends, one by one, and analyze the suggested causes underlying the adverse health- and traffic safety indicators.

2. Materials and methods

All data were retrieved from the official databases of the National Health and Welfare Board (Socialstyrelsen; SoS) and of the Swedish Road Administration (Vägverket; VV). Hallberg and Johansson (2004) have presented worrying trends related to public health in Sweden [1]. Hallberg (2007) showed that many adverse health indicators were worse in sparsely populated areas, as hypothesized caused by higher average output power from mobile phones in those areas [2].

3. Results and discussion

1. Lung cancer among elderly men increased markedly beginning after 1997 (Fig. 1). For men aged 80–84 years, the incidence increased from 160 to 230/100,000. For men aged 85+, the incidence increased from 95 to a high of 180/100,000 in 2005. The SoS has not publicly offered any explanation for these increases or commented on this matter.
2. In 1997, the incidence of prostate cancer abruptly increased in all age groups (Fig. 2). In Stockholm, the number of cases in men aged 50–59 stayed fairly stable

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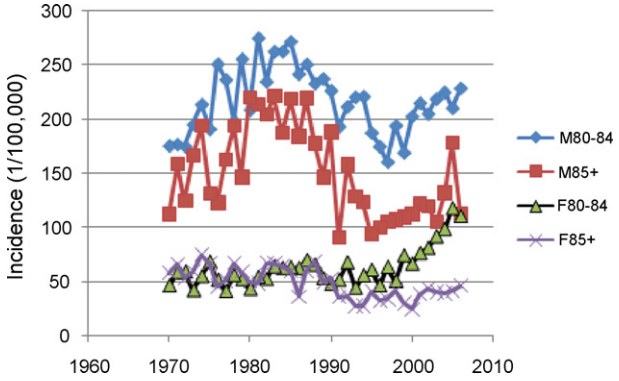


Fig. 1. Lung cancer in the elderly (male (M) and female (F)) has increased in Sweden since 1997.

at around 30 cases per year up to 1996, despite the fact that PSA tests were used routinely starting in 1991. After 1996, when 33 cases of prostate cancer were reported, the number of cases increased to around 300 per year in 2004 and 2005. SoS originally suggested that the apparent increase in prostate cancer was due to the improved diagnostic capabilities of the PSA test. When asked again, the SoS said, "It cannot, however, be ruled out that a certain increase would have been noticed even without these PSA tests, but we don't know how large this increase would have been." Notably, however, the step-like increase in prostate cancer did not coincide with the introduction of the PSA test in 1991.

3. For several decades, the rate of skin melanoma was very stable among younger people (<50 years), despite publicity about the dangers of sun exposure. However, after 2000 the incidence of melanoma of the head and neck region suddenly started to increase in this population (Fig. 3). Simultaneously, the rate of more benign skin tumours dropped, and the sum total of tumours and melanoma continued to increase. However, small carcinomas that would previously have developed into relatively benign tumours now seem to increasingly develop into melanoma. SoS has not commented on this in their reports.

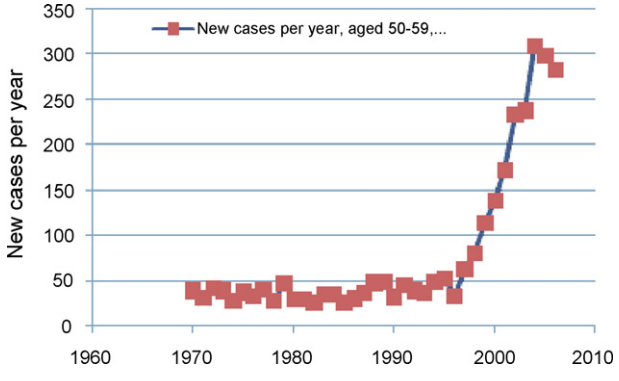


Fig. 2. The number of newly reported cases of prostate cancer in men aged 50–59 years in Stockholm County, Sweden.

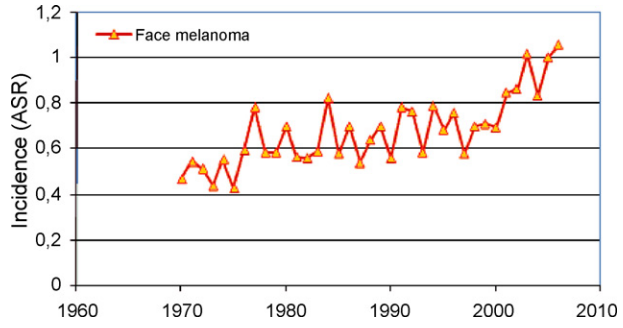


Fig. 3. Melanoma of the face has increased in Sweden among people <60 years since 2000.

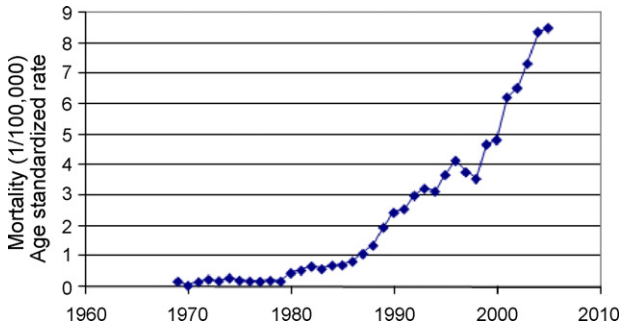


Fig. 4. Alzheimer's mortality has increased steeply since 1998 in Sweden.

4. Mortality associated with Alzheimer's disease has increased dramatically since 1998 (Fig. 4). Today, the incidence is 9/100,000, an increase of 300% in 10 years. When queried, the SoS suggested that this increase can be attributed to an increase in the practice of declaring Alzheimer's disease as the cause of death when signing the death certificate. SoS also claims that there are no grounds for stating that mortality has actually increased. However, a thorough analysis of the data indicates that there is an increase in mortality in older people with this disease [3].
5. In 1985, the number of people seriously injured in Stockholm traffic accidents was around 650. Subsequently, there was a decrease in injuries to a low of 350 in 1997. After 1997, the number of people injured annually started

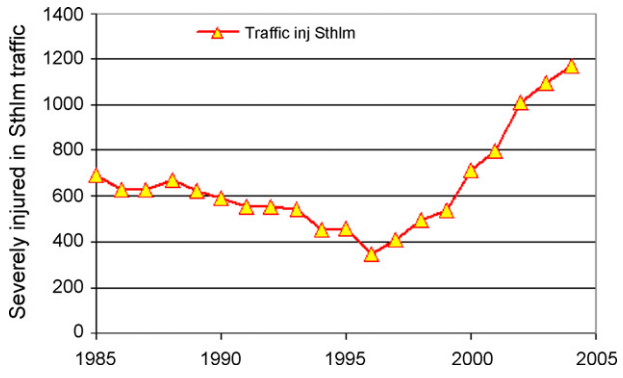


Fig. 5. Traffic injuries in Stockholm have increased since 1997.

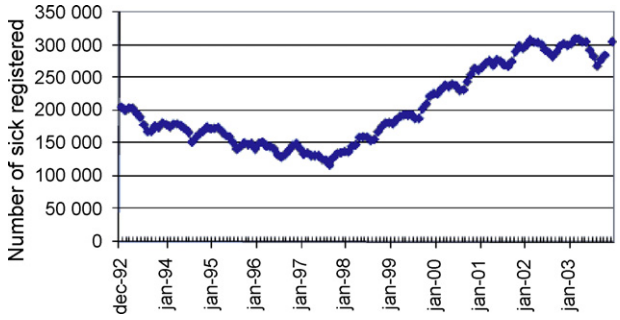


Fig. 6. The number of people in Sweden registered as sick suddenly increased starting in September 1997.

increasing, reaching 1200 in 2005 (Fig. 5). According to VV, this trend is partly the result of the introduction of a better reporting system in Stockholm. Nonetheless, the increasing number of people severely injured in Swedish traffic ended the downward trend observed until 1997: This number has rapidly increased since 2000. Today, VV reports that the number of people who were severely injured per killed increased rapidly in Stockholm County in the time period 2000–2004.

6. The total number of people taking sick leave was just over 200,000 in 1992. This number decreased steadily to around 125,000 in September 1997. After that time, the trend broke, and we saw an increase to over 300,000 people registering as sick in 2003 (Fig. 6). The authorities have not given any explanation for this abrupt increase in the number of people who registered as sick. It is not likely due to improved diagnostics, but rather to the fact that more people needed to take sick leave. In November 2001, the leader of the KD party, Alf Svensson, commented that "sick-cheating" was one explanation. In contrast to earlier trends, the increase in sickness appears to be greater in more sparsely populated regions. In the beginning of the 80s, it was considered healthy to live in the countryside, since people were healthier there. A closer analysis of sick leave data in different counties shows that the Northern counties and the Gotland island were the last counties to show an increase in sick leave rates. These counties did not show increasing rates until February 1998. In contrast, the increase was observed early on in Blekinge and Kronoborg, where the increase was noticeable in September/October of 1997.
7. The number of new brain tumours in people >60 years old suddenly increased after 2000 (Fig. 7). This development paralleled the increase of melanoma in the face region of people <60 years. In general, the incidence of brain tumours is increasing most in more sparsely populated regions where mobile phones often need to use full output power [2,4].
8. The percentage of newborns with heart problems began to increase after 1998 (Fig. 8). It was recently reported that fetuses and neonates react to their mother's mobile phone use with an increased pulse rate and decreased blood flow

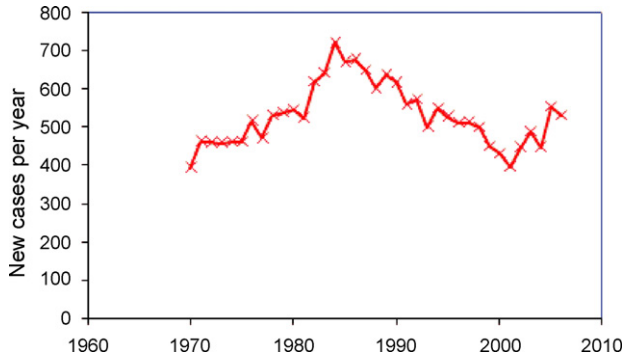


Fig. 7. Brain tumours among in the elderly (>60 years) have increased since 2001 in Sweden.

[5]. Another report published in the well-known journal *Epidemiology* [6] suggests that such mobile phone use may also influence emotional development and may increase the risk of hyperactivity, behaviour problems, and relational problems with other children up to the time that children start school.

A dramatic environmental change took place in Sweden in the autumn of 1997. At this time, GSM 1800 MHz transmitters were put into use to increase transmission capacity, especially in urban areas, see Fig. 8. Much of the population began to be exposed to 1.8 GHz microwaves both at night and during the day. In the Stockholm area, people began to steer cars using only their right hands while holding the mobile phones by their left hands. The Post- and Telecom Administration states that GSM 1800 MHz began to be used in 1997, but has no information on starting months in different counties. When Telia were queried about starting dates

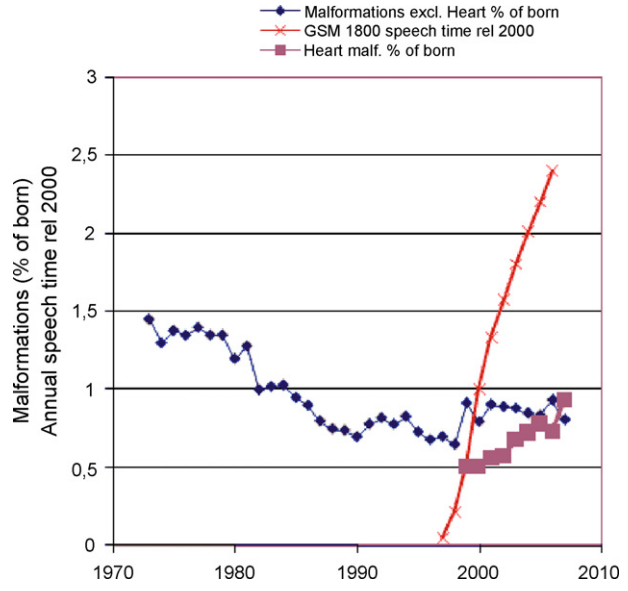


Fig. 8. The percentage of newborns with heart problems has increased since 1998 in Sweden. Also shown is the annual speech time in dual band mobile phones relative to year 2000. The down going trend of malformed newborns excluding heart problems is now broken since 1998.

for transmitter operation, Telia responded that they will not release this information. "The reason is that this information reasonably has no association with sick registration levels in Sweden in 1997." In 2001, the roll-out of the 3G network started and the use of the higher and probably more biological hazardous frequency, around 2.1 GHz, increased. More details about relevant events in 1997 are described in reference [1].

4. Conclusion

The negative trends in public health indicators in Sweden are not fully explained by better diagnostics, better instrumentation, or better doctors. Because these indicators may reflect real world changes, efforts should be made, starting immediately, to determine the underlying cause or causes.

Conflict of interest

There is no conflict of interest known to the authors related to this work.

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