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The Cruel Deception

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With new legislation to replace the Cruelty to Animals Act 1876 near at hand, the powerful vested interest groups whose profits and livelihood depend on laboratory animals are stepping up their campaigns to ensure the survival of vivisection. Have the benefits really been so great, and can vivisection achieve major advances in our present state of health?

History shows (McKeown 1979) that the real reasons for the dramatic increase in life expectancy since the middle of the last century are improvements in nutrition, living and working conditions, hygiene and sanitation, with medical measures only having a relatively marginal effect. The reduction in Britain's death rate from the 1850s was almost exclusively due to the decline of the infections—mainly TB, bronchitis, pneumonia, influenza, whooping cough, measles, scarlet fever, diphtheria, smallpox, and the water- and food-borne diseases such as cholera, typhoid, diarrhea, and dysentery. Mortality for nearly all the infections was declining before, and in most cases long before, specific therapies became available.

The Evidence

Beginning with the airborne infectious diseases, it can be seen that deaths from *tuberculosis* were falling well before the introduction of specific measures to treat or prevent it (McKeown and Lowe 1976; see figure 1, page 10).

Specific drug treatment, introduced in 1947, is considered to have speeded up the decline in England and Wales, but not in America (McKinlay and McKinlay 1977). Whilst it is difficult to assess the contribution of BCG vaccination after introduction in Britain, some doubt surrounds its value under all circumstances (Weitz 1982), whilst the Netherlands had the lowest death rates from respiratory TB for any European country in 1957-59 and in 1967-69 despite its having no national BCG program (McKeown 1979).

Until recently, *pneumonia, bronchitis,* and *influenza* were grouped together in national statistics (McKeown 1979). The introduction of antibiotics does not seem to have made an impact on the declining death rate (McKeown 1979; see figure 2, page 10), but this is hardly surprising, because acute bronchitis and influenza are viral diseases for which antibiotics are ineffective. What the diagram does show is that mortality was declining before any specific medical treatment.

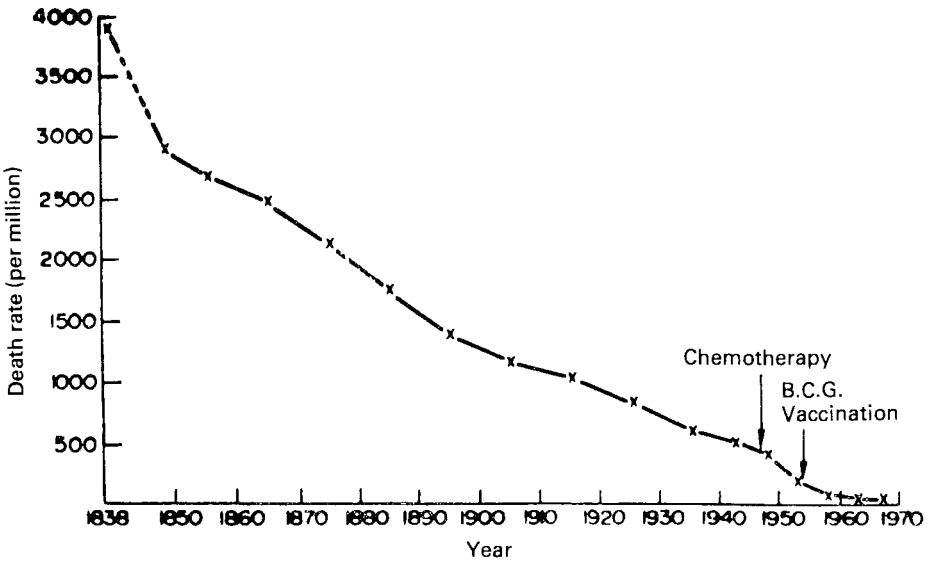


Figure 1. Respiratory tuberculosis: mean annual death rate: England and Wales.

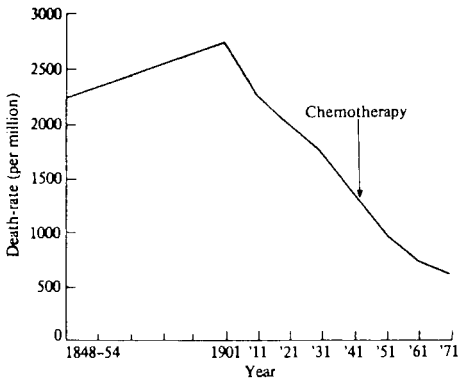


Figure 2. Bronchitis, pneumonia, and influenza: death rates (standardized to 1901 population): England and Wales.

In the United States, on the other hand (McKinlay and McKinlay 1977), statistics are available for pneumonia since 1900 and show that death rates were declining well before the introduction of sulphonamides or antibiotics (figure 3).

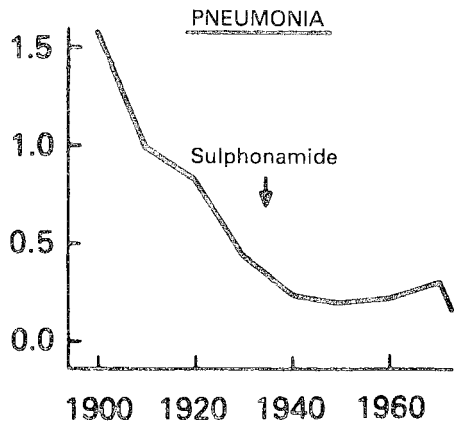


Figure 3. Fall in the standardized death rate per 1000 population in relation to specific medical measures. United States 1900-1970. (After John and Sonja McKinlay 1977.)

In England and Wales, pneumonia gained a place for itself in the national statistics from the early 1930s, and although it is known from clinical experience that antibiotics can treat bacterial diseases, it is difficult to judge their overall contribution from death rates which were already declining. Unhappily, pneumonia, bronchitis, and influenza are still major causes of sickness and death. Since there are many forms of influenza virus, vaccines against one form may be useless against another.

The decline in death rate from *scarlet fever* was well under way before the introduction of sulphonamides in 1935 and antibiotics in 1945 (McKeown and Lowe 1976; see figure 4, page 12).

The death rate from *whooping cough* in England and Wales has declined rapidly since the 1860s (McKeown 1979; see figure 5, page 12). The value and safety of immunization has been hotly debated and in West Germany, where the vaccine was not used nationally, the number of cases still declined (McKeown 1979).

Measles has declined in much the same way as whooping cough, in this case immunization being introduced in England and Wales only recently in 1968 (see figure 6, page 12).

The declining death rate from *diphtheria* in children under 15 years of age is illustrated in figure 7, page 13 (Porter 1971).

Although the sharp decline in death rates between 1860 and 1875 was not associated with any specific therapy, later declines coincided first with the introduction of antitoxin treatment and secondly with the introduction of a national immunization campaign. Had mortality from other common childhood infections remained the same or increased at the same periods then it would be tempting to assume that antiserum and immunization were mainly responsible for the decline in diphtheria deaths around 1900 and 1940.

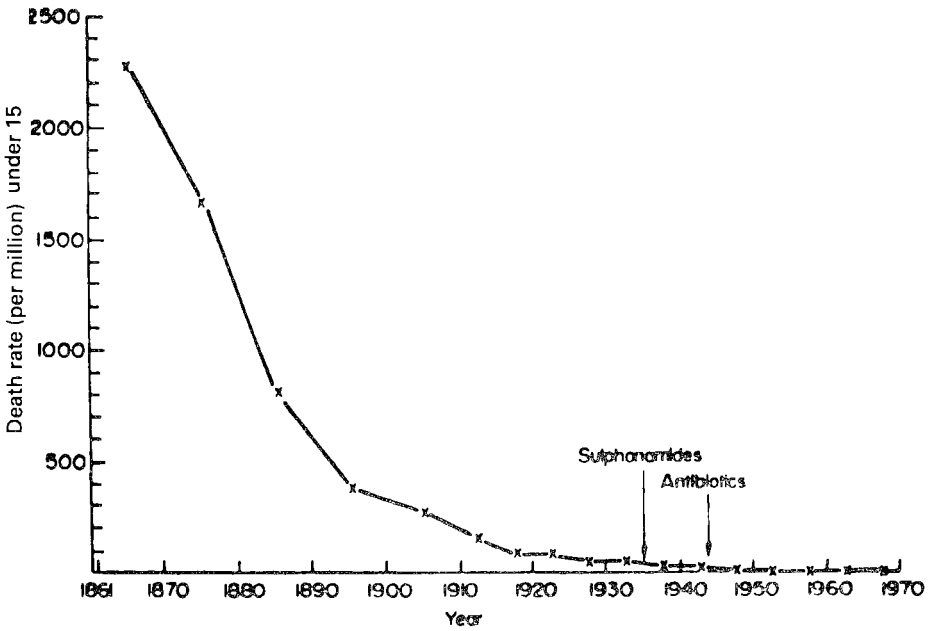
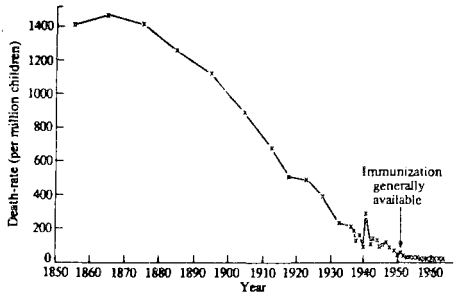


Figure 4. Scarlet fever: mean annual death rate in children under 15: England and Wales.



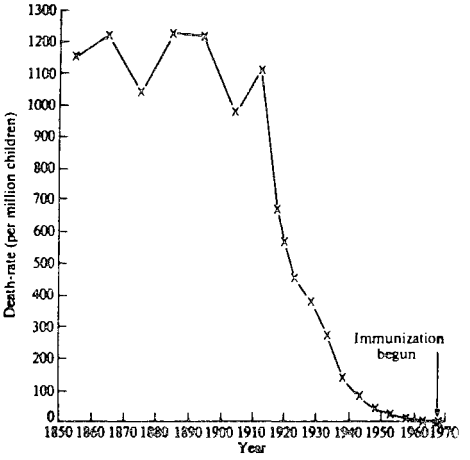


Figure 5. Whooping cough: death rates of children under 15: England and Wales.
Figure 6. Measles: death rate of children under 15: England and Wales.

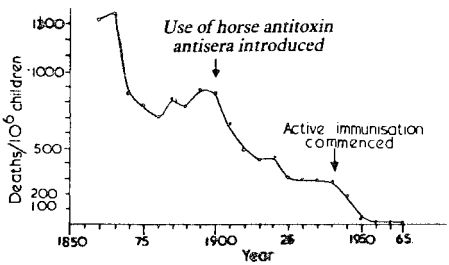


Figure 7. Deaths of children under 15 years attributed to diphtheria.

But deaths from measles and whooping cough, for instance, did decline over this period without any treatment or immunization, suggesting that other influences may also have been operating with diphtheria.

At the same time the value of antitoxin treatment had never been accepted generally (Porter 1971), whilst in the U.S. at least (McKinlay and McKinlay 1977), introduction of immunization did not produce major detectable changes in the already declining death rate. It is clearly not possible to assess accurately the contribution of these measures to the decline of deaths due to diphtheria in England and Wales.

The combined death rates from the commonest infections of childhood (scarlet fever, diphtheria, whooping cough, and measles) among children up to 15 years old, shows that around 90% of the total decline in mortality between 1860 and 1965 had occurred before the introduction of antibiotics, and widespread immunization against diphtheria (Porter 1971; see figure 8).

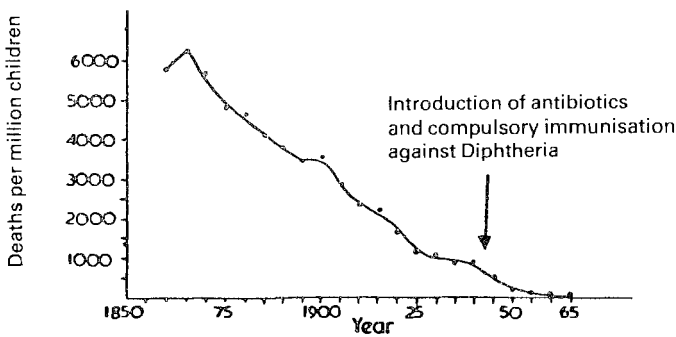


Figure 8. Deaths of children under 15 years attributed to scarlet fever, diphtheria, whooping cough, and measles.

Although the contribution of *smallpox* to the overall decline in death rate in England and Wales between the 1850s and 1970s was small (McKeown 1979), this is the one major disease for which vaccination was available before 1900.

Once again, it is not easy to assess accurately the contribution of vaccination, and historical analysis has shown that a combination of effects is likely to have been responsible (Hardey 1983; see figure 9). Lack of reliable information during earlier centuries coupled with simultaneous decline of many other infectious diseases, suggesting influences other than vaccination, make interpretation of the declining death rate for smallpox difficult. Vaccination was stopped in this country after 1940 when risks were considered to outweigh the benefits.

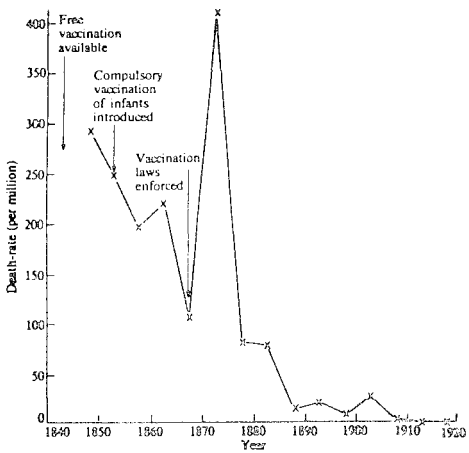


Figure 9. Smallpox: death rates: England and Wales.

Inoculation against smallpox had been practiced in the Far East for many centuries, long before Jenner developed a vaccine using cowpox in 1798. It is thought that Lady Wortley Montague (Porter 1971), wife of the British ambassador in Constantinople, introduced inoculation against smallpox into this country [United Kingdom] during the early 1700s. Small amounts of material from the pustules of smallpox sufferers were inoculated into those seeking protection, immunity being conferred against dangerous attacks. It had also been realized that risks from the inoculation could be reduced by making fluid from the pustules less virulent (Inglis 1963).

Developing protection against smallpox has travelled full circle. Centuries ago, human material from fellow sufferers was used. In more modern times smallpox vaccine was produced using animals, but recently techniques have been developed to produce the vaccine from human cells in culture.

Declining death rates from water- and food-borne diseases, such as cholera, dysentery, diarrhea, typhoid, and nonrespiratory tuberculosis, also made a

major contribution (McKeown 1979; McKeown and Lowe 1976). *Cholera* was introduced into Britain from the continent of Europe during the nineteenth century. The last epidemic was in 1865 and from that time cholera was negligible.

The decline of cholera is a good example of how practical advances are not necessarily dependent on scientific understanding (Porter 1971). By careful observation John Snow deduced that contaminated water was the origin of the spread of cholera in a London outbreak. In 1854 he removed the handle of the Broad Street pump to prove his point and the outbreak stopped. Yet this was nearly 30 years before the discovery of the cholera bacterium.

The general decline of the *diarrheal diseases* began in the late nineteenth century. From the early 1900s, a rapid decline set in and by the time intravenous rehydration therapy was introduced in the 1930s to prevent dehydration, 95% of the decline had already occurred (McKeown 1979).

The decline of the enteric fevers—*typhoid* and *paratyphoid*, a major killer of the 19th century—was also rapid and began before the turn of the century. Specific treatment was not available until 1950, but by then mortality from enteric fever had almost been eliminated in England and Wales (McKeown 1979).

Tuberculosis can also arise by drinking milk from cows with bovine tuberculosis. Disease levels were already low by the time the first specific treatment, streptomycin, was introduced (McKeown 1979).

Consequently, deaths from nearly all the infectious diseases were declining before, and in most cases long before, effective therapeutic procedures became available. According to a detailed analysis by McKeown (see McKinlay and McKinlay 1977), the situation for the 19th century can be summarized:

> ...the decline in mortality in the second half of the nineteenth century was due wholly to a reduction of deaths from infectious diseases; there is no evidence of a decline in other causes of death. Examination of the diseases which contributed to the decline suggested that the main influences were: a) rising standards of living, of which the most significant feature was a better diet; b) improvements in hygiene; and c) a favorable trend in the relationship between some micro-organisms and the human host. Therapy made no contributions, and the effect of immunization was restricted to smallpox which accounted for only about one-twentieth of the reduction of the death rate.

Whilst for the 20th century:

> The main influences on the decline in mortality were improved nutrition on air-borne infections, reduced exposure (from better hygiene) on water and food-borne diseases and less certainly, immunization and therapy on the large number of conditions included in the miscellaneous group. Since these three classes (of infections) were responsible respectively for nearly half, one-sixth, and one-tenth of the fall in death rate, it is probable that the advancement in nutrition was the major influence.

And in the United States, American researchers J. and S. McKinlay of Boston University have concluded (McKinlay and McKinlay 1977):

> In general, medical measures (both chemotherapeutic and prophylactic) appear to have contributed little to overall decline in mortality in the United States since about 1900—having in many instances been introduced several decades after a marked decline had already set in and having no detectable influence in most instances. More specifically, with reference to those five conditions (influenza, pneumonia, diphtheria, whooping cough, and poliomyelitis) for which the decline in mortality appears substantial after the point of intervention —and on the unlikely assumption that all of this decline is attributable to the intervention—it is estimated that at most 3.5% of the total decline in mortality since 1900 could be ascribed to medical measures introduced for the diseases described here.

Declining Death Rates

Rene Dubos (Pasteur's biographer):

> ...by the time laboratory medicine came effectively into the picture the job had been carried far toward completion by the humanitarian and social reformers of the nineteenth century (*Mirage of Health*, 1959, New York).

Consequently, society's "control" of the infectious diseases rests primarily on efficient public health services and a good standard of living. Medical measures clearly played only a relatively minor role in increasing life expectancy. It must therefore be concluded that, *at most,* animal experiments had only a marginal effect on reducing the death rate, even on the unlikely assumption that animals were involved in developing all such measures.

Of course animals were not involved in all therapeutic advances, in truth many discoveries being initially made by human observation, only later to be retested on animals! Examples include the discovery of vitamins and the early inhalation anesthetics (which enabled surgery to advance rapidly), as well as many vital medicines such as morphine and digitalis (Koppanyi and Avery 1966; Talalay 1964; see also *Clinical Medical Discoveries* by M. Beddow Bayly, 1961, National AntiVivisection Society).

The Situation Today

According to national statistics the principal causes of death in today's Western society include heart disease, cancer, strokes, bronchitis and emphysema, alcohol-related problems, diabetes, and high blood pressure, most of which are very difficult or impossible to cure but all largely preventable, because they are often caused by our affluent and wasteful Western lifestyle. We suffer these illnesses because of faulty diet and because we smoke, eat and drink to excess, fail to exercise properly and allow our environment to be polluted by dangerous substances.

One example is smoking, which is considered to be the single most preventable cause of death in the United Kingdom, being responsible for 100,000 premature deaths a year (Russell 1982; *Brit. J. Addiction* 1984). Tobacco has been connected with various cancers, heart disease, bronchitis and emphysema, peptic ulcers, and is a hazard to the fetus (*Brit. Med. J.* 1983). Another example is faulty diet, which has been linked to heart disease, certain common cancers, strokes, diabetes, high blood pressure, and a host of other diseases (*New Scientist* 1983).

Consequently if *major* advances in our health are to be achieved the emphasis must be on prevention, since treatment is so difficult. Once again, it follows that *at best*, animal experimentation could only have a marginal impact, even assuming it to be a reliable, or indeed the only, method of research.

Are We Getting Healthier?

In recent years, with animal experiments carried out on a huge scale, has our overall health improved? In 1951, a 45-year-old man could expect to live an extra 26.4 years, whilst in 1981 he could a further 27.5 more years (*Social Trends* 1985). Despite this small increase, evidence from America suggests that this is more than counterbalanced by more years of serious disablement (Melville and Johnson 1982).

According to the General Household Survey (*Social Trends* 1984), there has been a progressive *increase* in the number of people reporting chronic sickness (defined as any long standing illness, disability, or infirmity) between 1972 and 1982. This is supported by Government figures which show an increase between 1967 and 1983 in the number of insured people incapacitated by sickness (*Social Security Statistics* 1984). In 1982 an astonishing 41% of British men aged between 45 and 64, and 42% of women in the same age group, reported being chronically sick (*Social Trends* 1985). In 1961, 233.2 million prescriptions were dispensed in the U.K. and this had risen dramatically to 389.2 million in 1983 (*Social Trends* 1985)! It doesn't look as if we are getting healthier.

Conclusion

This article has not addressed ethical issues or the frequently misleading nature of animal-based research. Nevertheless, analysis of disease trends has enabled the following conclusions to be reached: i) The dramatic increase in life expectancy since the middle of the last century is overwhelmingly based on improvements in public health; ii) The impact of animal experiments on such improvements in health can only have been marginal, *at best*, whilst major advances in the future must once again come from disease prevention; iii) Despite the enormous scale of animal experimentation in recent years, our overall health appears to be declining.

Of course there is a place for research, but conducted humanely without using animals. Nevertheless, whatever methods are used, much more could be achieved by effective disease prevention campaigns.

Endnotes

[1] Reprinted with permission from *Animals' Defender and Anti-Vivisection News*, May/June 1985.

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