Commentary: John Snow’s ‘On the Supposed Influence of Offensive Trades on Mortality’: the ‘Snow paradigm’

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In 1855, the renowned anaesthesiologist-epidemiologist John Snow, President of the Medical Society of London, physician to the royal family, irritant of the British sanitarians, then at the height of his prestige, appeared before the British Parliament’s Select Committee on Public Health on the Nuisances Removal and Disease Prevention regarding the need to “tackle the problems of accumulations of excrement and street refuse, industrial waste and smoke, polluted rivers, slaughterhouses, and filth”.1 As one who considered the mouth as the portal for the entry of all pathogens into the body, Snow had little concern regarding the potential adverse health effects of the merchants and factory owners in Southwark whose cause he was championing.2 Were Parliament to enact any legislation restricting the disgorgement of such ‘pathogens’ into the environment, particularly near residential housing, those merchants and factory owners may no longer have had their businesses. It was on behalf of those merchants and factory owners (those with involvement with the ‘offensive trades’ including gasworks, bone boilers, soap manufacturers, tallow melters, dye makers, leather tanners and the like) that Snow’s name as an expert on such health matters had been put forward as one whose testimony might inform the Committee in its consideration of the proposed law.1,3

Snow appeared before the Committee on 5 March 1855. He made clear his view that these ‘offensive trades’ presented no health risk to those residing near them; that the increased mortality from cholera in South London resulted from the use of cholera-infested water supplied by the Southwark and Vauxhall Water Company; and that he believed that ‘epidemic diseases are propagated by special animal poisons coming from diseased persons and causing the same diseases to others’.3

This testimony was not well received in all quarters of the Victorian London medical community. The Lancet published an editorial condemning that testimony. The editorial left little doubt in its stinging criticism, noting that Snow:

…has a theory, to the effect that animal matters are only injurious when swallowed! The lungs are proof against animal poisons; but the alimentary canal affords a ready inlet. Dr. Snow is satisfied that every case of cholera, for instance, depends upon a previous case of cholera, and is caused by swallowing the excrementitious matter voided by cholera patients. Very good! But if we admit this, how does it follow that the gases from decomposing animal matter are innocuous?… If this logic does not satisfy reason, it satisfies a theory; and we all know that theory is often more despotic than reason. The fact is, that the well whence Dr. Snow draws all sanitary truth is the main sewer. His specus, or den, is a drain. In riding his hobby very hard, he has fallen down through a gully-hole and has never been able to get out again.4

Snow’s biographers Vinten-Johanssen et al.2 suggest that this editorial reflected the lack of data upon which Snow had based his views. Perhaps stung by the Lancet editorial, perhaps for other reasons unknown, Snow published his analysis on the impact of the ‘offensive trades’ on mortality in 1856.3 His other publications2 after the 1855 testimony provide little enlightenment regarding why he pursued this topic with a formal analysis. He apparently received no compensation for his testimony to Parliament,1,2 so it seems unlikely that that he received any for drafting this paper. One of the facets to this episode that will remain unresolved is what Snow’s motivation might have been in publishing this paper. What is clear is that Snow never returned to this topic again in any of his future writings.

What can we learn from this episode in Snow’s life? First, it represents one of the first instances (if not the
In which an epidemiologist outside a governmental agency attempted to overtly influence health policy, Snow placed first before Parliament and then the medical community the data upon which he based his opinion regarding the impact of the offensive trades on mortality in London south of the Thames. He noted the deficiencies in those data and tried to frame his opinion within those limitations. In the more than 150 years since, epidemiologists have followed this approach in making their marks upon health policy, for perfect data have not been, are not now and likely will not be, available at any time in the future. The perfect epidemiological study has yet to be conducted, and Snow’s paper is a reminder that whereas perfection should be sought when conducting an epidemiological analysis, its absence does not preclude action in the interest of the public’s health. The perfect should not be the enemy of the good, particularly when it concerns the public’s health. Epistemological nihilism has a place in scientific research; however, there comes a point where one must use whatever data one has available, assess and factor in the biases and other weaknesses possibly present in those data and then reach a conclusion translatable, if appropriate, into action improving the public’s health. Epidemiology transcends epistemology, as it provides a means for the advancement of the common good. Snow’s paper illustrates this aspect of the epidemiological enterprise.

Second, Snow continued in his focus on cholera, particularly in further demonstration that the causal agent gained access to the body through the mouth (and gastrointestinal tract) rather than through the nose (and respiratory system). It was not just cholera that Snow was concerned with being spread orally; as his biographers Vinten-Johansen et al. note, he would soon begin studies on rickets—with the hypothesis of an orally-based aetiology for the disease. For Snow, pathogens seemingly could not be introduced into the body through the respiratory system. Hence, whatever the aesthetic impact of the offensive trades might have been, they could not have health consequences; that theme is clear in this paper.

Third, we can glean some insight into the workings of the Registrar General’s Office. Though Snow was able to obtain from the Registrar General’s Office (through Farr) mortality data for individuals by occupation, he apparently was not able to do so by occupation and age. Why this was the case is not stated. One can speculate about professional rivalries and the like, though these seem unlikely. Farr had ample opportunity to summarily dismiss Snow’s work in his 1852 review on the aetiology of cholera, and he did not do so; certainly Farr was aware of Snow’s work. Another possibility is the lack of resources available to Farr for compiling the information. Lastly, this paper triggered another stinging editorial in the *Lancet,* as well as some methodological criticisms (in the form of a letter) from a fellow member of the London Epidemiological Society, Dr John W Tripe (Medical Officer of Health for Hackney). We do not know how influential either the editorial or the letter might have been. Snow apparently did not provide any response.

In conclusion, whereas Snow is best known among epidemiologists for both his contributions to our understanding of cholera and his demonstration of the utility of the population-based epidemiological study, his contributions to epidemiology include the interface between epidemiology and health policy. He provided a case study on the use of incomplete data to reach a conclusion with considerable impact on the public’s health. Snow did so while not availing himself of a team of workers. This paper represented the efforts of one man: John Snow. Though the thought of an individual epidemiologist undertaking such an analysis may seem quaint by today’s standards, it also shows Snow’s ability to translate an aetiological hypothesis into an epidemiological analysis and the power that such clarity of thought provides. For today’s students of epidemiology, that clarity—the Snow paradigm—exemplifies how one progresses an epidemiological idea hopefully to impact positively on the public’s health.

**Conflict of interest:** None declared.

**References**