

Editorial

Missing the Forest for the Trees in Biomedical Research: The Example of Noma

Joseph M. Vinetz

Division of Infectious Diseases, University of California, San Diego School of Medicine, La Jolla, CA

Month after month passed after the outbreak of the epidemic, without the higher governmental authorities taking the least notice of its occurrence. Autumn had gone, winter was approaching and with it the spectres of hunger and cold—nothing was done. Finally, small sums of money were granted for direct distribution to the needy, but the red tape of the bureaucracy was such, even in this, that they requested detailed receipts on the distribution of the money which was supposed to be given out in the smallest of amounts, so as to be able to submit them to the general auditing chamber. Finally, the press began to broadcast, through Prussia and the whole of Germany, the inconceivable and incredible happenings in Upper Silesia.

—Rudolf Virchow, “Report on the Typhus Epidemic in Upper Silesia”¹

Thus Rudolf Virchow describes the German government’s response to the epidemic of “typhus” in Upper Silesia in the 1840s. Virchow, the polymath pathologist (who is most famous for developing the cell theory of disease) was a political activist who fought on the barricades during the European revolutions of 1848. He argued that the essential cause of this epidemic that affected tens of thousands was the Prussian government’s inaction and cultural mandates imposed on a foreign, colonized people. As Howard Waitzkin notes, “Virchow argued that defects of society formed a necessary condition for the emergence of epidemics. According to this analysis, inadequate social conditions increased the population’s susceptibility to climate, infectious agents and other specific causal factors—none of which alone was sufficient to produce an epidemic. For the prevention and eradication of epidemics, social change was as important as medical intervention, if not more so.”² Ironically, despite being a founder of the modern cell theory of disease, Virchow criticized the pursuit of pure or detached science in the absence of addressing important societal concerns, concluding that “It certainly does not detract from the dignity of science to come down off its pedestal—and from the people science gains new strength.”² Science and scientific medicine, according to Virchow, should not be detached from sociopolitical reality. On the contrary, he argued, the scientist must seek to link the findings of research to political work suggested by that research.

Noma is an ancient disease, probably noted in classic Greek and Roman medical texts, clearly described and found to be common by medieval and Renaissance European writers.³ Secular trends that led to marked improvement in public health, nutrition and general socioeconomic status in industrialized countries in the 20th century led to the disappearance of noma from all places other than the most desperately poor and where severe malnutrition occurs. Enwonwu and colleagues graphically describe noma (also known as *Cancrum oris*) in rather stark prose: “a debilitating oro-facial gangrene [which] starts as a localized gingival ulceration and spreads rapidly through the oro-facial tissues, establishing itself with a well-demarcated perimeter surrounding a blackened, necrotic centre.” There is “a striking fetid odour, a progressive necrotizing stomatitis, and the typical cone shaped necrotic zone—*cône gangréneux*—in an anxious, so far kept hidden, drooling child.”⁴ Myriad factors contribute to this disease including malnutrition, post-infectious debility and immune suppression. Pathogenetically, acute necrotizing gingivitis results in overgrowth of normal oral microflora resulting in a rampaging full-thickness gangrene of the facial tissues. Further, noma is

an “infectious” disease of unknown etiology, with “further research . . . needed to identify more exactly the causative agents.”⁵ These dispassionate and important descriptions note the single key to this terrifying and utterly neglected disease: the forgotten developing-world child who is the victim of social deprivation.

Within these complex historical and modern contexts, Srour and others publish their observations on noma in Laos in this issue.⁶ The authors note that noma is rarely recognized in Asia, while it has been well-recognized in Africa, and is an ominous stigma of severe poverty. Awareness of several risk factors, learned in rural Africa, is key to recognition of this disease: poverty, stunting, malnutrition, poor food security, and co-morbid infections of poverty including measles and malaria. True to form in the tradition of social medicine as Virchow so elegantly put forth, the authors note that effective prevention of this disease suffers from bureaucratic inattention. In this paper, the authors couch this in the sterile language of the 21st century: “the true burden of disease will be very difficult to determine because of the high mortality of acute noma [and] lack of reporting systems” among many other factors.

In modern history, fascination by etiologies and pathogenetic mechanisms of infectious diseases was accompanied by the discovery of magic-bullets—antibiotics and vaccines—discoveries of which were based in detached laboratory science. These discoveries obviously have clearly produced innumerable benefits in rich and poor countries alike. Nonetheless, we continue to witness a battle between the pursuit of pure science—whose applicability to the benefit of humankind may seem tenuous to some—and the social mandate for translating basic science discoveries into new treatments and preventatives. This battle is exacerbated in the current era of dire competition for declining public research resources. As exemplified by noma, social action, not laboratory-based research, is necessary to intervene against this and many other diseases of abject poverty. For many of the diseases that disproportionately affect the poor and dispossessed, what is necessary is to maintain basic human rights: adequate nutrition, food and water security, basic vaccinations and environmental sanitation, and transparency in government. The search for basic science-based magic bullets to intervene against many neglected diseases misses the forest for the trees.

REFERENCES

1. Virchow R, 1848. Report on the Typhus Epidemic in Upper Silesia. *Translation in L.J. Rather, ed., Collected Essays in Public Health and Epidemiology, 1985, Sagamore Beach, MA: Watson Publishing, reprinted in Social Medicine, vol 1, No. 1, 2006. Available at: <http://journals.sfu.ca/socialmedicine/index.php/socialmedicine/issue/view/5/showToc>.*
2. Waitzkin H, 2006. One and a half centuries of forgetting and rediscovering: Virchow’s lasting contributions to social medicine. *Social Medicine 1*: 5–10.
3. Marck KW, 2003. A history of noma, the “Face of Poverty”. *Plast Reconstr Surg 111*: 1702–1707.
4. Enwonwu CO, Phillips RS, Ferrell CD, 2005. Temporal relationship between the occurrence of fresh noma and the timing of linear growth retardation in Nigerian children. *Trop Med Int Health 10*: 65–73.
5. Enwonwu CO, Falkler WA Jr, Phillips RS, 2006. Noma (cancrum oris). *Lancet 368*: 147–156.
6. Srour ML, Watt B, Phengdy B, Khansoulvong K, Harris J, Bennett C, Strobel M, Dupuis C, Newton PN, 2008. Noma in Laos: stigma of severe poverty in rural Asia. *Am J Trop Med Hyg 78*: 539–542.