Self-poisoning

Unalterable host factors? A social epidemiologist's view of the Haddon matrix

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Many host factors that have been defined as “unalterable” from the biological or clinical point of view might actually be “alterable” from a sociological or cultural point of view

The Haddon matrix has been used both to conceptualize etiologic factors for injury and to identify potential preventive strategies.^{1,2} In this issue, the matrix has been used by Eddleston *et al* to identify strategies to prevent death after pesticide self-poisoning (see page 333).³ I certainly agree with the authors of this paper that intentional pesticide self-harm is an important but neglected public health problem, not only because of its size but also because of its preventability.

I do not, however, entirely agree with some of the depictions of host factors in their matrix. In this editorial, I want to illustrate how, compared with traditional epidemiologists, social epidemiologists might have different depictions of the same host factor or identify different host factors. I argue that many of the so-called “unalterable” host factors can be viewed as “alterable”, depending on how the theoretical conceptual framework is used. These differences have great implications for injury prevention. Any host factor defined as “unalterable” or “not modifiable” will never be a candidate in the agenda of prevention strategies.

PRE-EVENT PREVENTION AND A BROADER VIEW OF ENVIRONMENT

Eddleston *et al* appear to be pessimistic about the primary prevention of self-poisoning using pesticides. They suggest that strategies to prevent deaths by restricting access to toxic pesticides may be effective but that there are considerable economic and regulatory barriers to their implementation. They repeatedly state that the substantial delay after the act of self-harm offers several opportunities to minimize damage. Accordingly, they invest most attention on event and post-event phases of prevention.

Taiwan, a newly industrializing country, also experienced many unnecessary pesticide poisoning deaths in 1970s and 1980s. One study in Taiwan revealed that county level pesticide suicide rates were highly correlated with the percentage of agricultural population of a county—a proxy for the availability of pesticide.⁴ In 1972, the government of Taiwan passed the Pesticides Regulation Act. Most of the regulations are targeted at manufacturers to decrease exposures to workers during the manufacturing process. In 1989, the Council of Agriculture promulgated a series of regulations on the use of pesticides through farmers associations located in every district in Taiwan—for example, registering buyers of highly toxic pesticides, providing lockable closets for storing the material, standardizing usage procedures, and educating public about pesticide lethality.

In the early 1990s, the Council of Agriculture required that manufacturers of paraquat, the most common agent of fatal poisoning in Taiwan, add an unpleasant odor and color, as well as emetics. This makes paraquat difficult to drink unintentionally or intentionally. The decreasing proportions of people using poisoning as a means of suicide in the 1990s might in part be due to these measures.⁵ This experience suggests that restricting access to toxic pesticides is not nearly as unfeasible as Eddleston *et al* imply.

With regard to regulatory barriers mentioned by Eddleston *et al*, Runyan proposed that we should adopt a broader view of “environment” in the Haddon matrix.² In addition to the physical environment she suggested that we should also consider the social environment. This involves the sociopolitical milieu affecting the process and could include cultural norms or mores (for example, alcohol consumption), political issues (for example, willingness

to adopt regulatory interventions that restrict access to pesticides or requiring industries to add emetics to pesticides), as well as the legal environment. The authors failed to offer more accounts of the social environment that impeded the implementation of “effective” strategies in Sri Lanka.

CAN WE CHANGE AGE, SEX, OR RACE?

In the abstract, Eddleston *et al* argued that many important host factors such as age, sex, and genetics are not alterable. Yes, we cannot change age, sex, or race. However, we can change ageism, sexism, or racism. For social epidemiologists, the identification of a social group at risk (for example, a particular racial/ethnic group or sex, the poor or isolated, recent immigrants) is usually based on the premise that something about the group's social or economic “experience” is risky, not their innate biologic or genetic background.⁶ By the same token, we cannot change genetic variants, but we can change the exposure environment so as to avoid the expression of some genetic variants.⁷

In Sri Lanka, men had higher intentional self-poisoning mortality than women. Eddleston *et al* attributed this sex difference to a high level of intent and alcohol intoxication among men. They also referred to the smaller size of women compared with men. If sex difference is a biological attribute, its effects should be the same across different countries. However, data in China revealed a different pattern—rural women had higher suicide rates than rural men.⁸ How might we explain this difference?

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Sex is a biological construct. Gender, on the other hand, is a social construct regarding cultural conventions, roles, and behaviors, as well as relationships between and among women and men and boys and girls.⁹ The questions the social epidemiologists ask are: how differently are men and women treated in different social and cultural contexts? How do the gender roles differ in different social and cultural contexts with regard to specific high risk behaviors?

In most societies men in their gender role are expected to be the main money earners and bear the financial responsibility of the family. Once a man loses his job, he will have higher level of stress and shame than a woman. This may partially explain the high level of

suicidal intent among men. Similarly, in many societies, alcohol drinking is only an acceptable behavior for men and may explain why acute and chronic alcohol drinking occurs so much more often among men in Sri Lanka as in many other countries.

Women in their gender role are expected to be the “servants of men” in many societies. As suggested by Phillips, many elderly rural Chinese women kill themselves to reduce the financial and emotional burden they cause their families.⁸ In rural areas of many developing countries, women have less opportunity of receiving higher education and therefore have poorer knowledge about the lethality of particular pesticides. All these gender related host factors are changeable, although perhaps not easily.

SOCIOECONOMIC POSITION: A NEGLECTED HOST FACTOR

To my surprise, socioeconomic position (SEP) does not appear to be in the host factor cells in the matrix. One possible explanation is that most of the studies reviewed by the authors did not include this factor. A Korean study showed that “the intent of using pesticide as a means of suicide was highly correlated with educational attainment”.¹⁰ In Taiwan—and I believe in many other countries—the areas with highest pesticide suicide rates were also the most deprived and disadvantaged.⁴ It is almost certain that people spreading pesticides are those in a lower SEP and thus more likely to use pesticides to kill themselves.

Socioeconomic position is not just one of the attributes of the host. For social epidemiologists, SEP is a fundamental construct that explains many other personal behaviors and attributes.

Many so-called life style behaviors (for example, acute or chronic alcohol drinking, help-seeking behavior) and psychosocial attributes (for example, impulsivity) are determined by unequal social structural relations in a society. Effective control of material, economic, social, political, symbolic, and cultural resources is differentially distributed within any society. Those who are exploited, dominated, or excluded have fewer resources and less control over them. Thus, SEP, observable in individuals, should also be conceptualized as extra-individual.¹¹

CONCLUSIONS

Different users of the Haddon matrix would identify different host factors or have different depictions of the same host factor according to the theoretical conceptual framework they use. Many host factors that have been defined as “unalterable” from the biological or clinical point of view might actually be “alterable” from a sociological or cultural point of view. One hundred years ago Durkheim pointed this out: “The suicide victim’s acts, which at first seem to express only his personal temperament are really the supplement and prolongation of a social condition, which they express externally”.¹²

Thus, many of the countermeasures for these “alterable” host factors to prevent intentional self-harm are beyond the health sector. A better economic policy would make it less likely that people lose their jobs. A better welfare system would ensure that the unemployed “man” and diseased “elderly woman” face less financial hardship. All such measures would decrease the level of intent of suicide.

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REFERENCES

- 1 Runyan CW. Using the Haddon Matrix: introducing the third dimension. *Inj Prev* 1998;**4**:302–7.
- 2 Runyan CW. Introduction: back to the future—revisiting Haddon’s conceptualization of injury epidemiology and prevention. *Epidemiol Rev* 2003;**25**:60–4.
- 3 Eddleston M, Buckley NA, Gunnell D, et al. Identification of strategies to prevent death after pesticide self-poisoning using Haddon matrix. *Inj Prev* 2006;**12**:333–7.
- 4 Lin JJ, Lu TH. Association between the accessibility to lethal methods and the method-specific suicide rates: an ecological study in Taiwan. *J Clin Psychiatry* 2006;**67**:1074–9.
- 5 Lu TH. Changes in injury mortality by intent and mechanism in Taiwan, 1975–1998. *Inj Prev* 2002;**8**:70–3.
- 6 Berkman L. Introduction: seeing the forest and the trees—from observation to experiments in social epidemiology. *Epidemiol Rev* 2004;**26**:2–6.
- 7 Davey Smith G, Ebrahim S. ‘Mendelian randomization’: can genetic epidemiology contribute to understanding environmental determinants of disease? *Int J Epidemiol* 2003;**32**:1–22.
- 8 Phillips MR, Li X, Zhang Y. Suicide rates in China, 1995–99. *Lancet* 2002;**359**:835–40.
- 9 Krieger N. A glossary for social epidemiology. *J Epidemiol Community Health* 2001;**55**:693–700.
- 10 Shin SD, Suh GJ, Rhee JE, et al. Epidemiologic characteristics of death by poisoning in 1991–2001 in Korea. *J Korean Med Sci* 2004;**19**:186–94.
- 11 Lynch J, Kaplan GA. Socioeconomic position. In: Berkman L, Kawachi I (eds). *Social epidemiology*. Oxford: Oxford University Press, 2000:13–35.
- 12 Durkheim E. *Suicide: a study in sociology*, Spaulding JA, Simpson G (trans). London: Routledge & Kegan Paul, 1952.

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