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**A Short Introduction to the Swedish System to Manage Outbreaks of Infectious Diseases
Among Humans and Animals**

Submitted by Sweden

Overview

Humans

1. The Swedish system for managing outbreaks of human diseases is based on actors with different responsibilities at different levels of the system. The main operational responsibilities rest with the Swedish counties (i.e. regions with an average 500.000 inhabitants that have a local government in charge of among other things public health). The main actors are the Medical officer in charge of infectious disease control (SmL), the health care system, and the environmental health offices in the communities (each county is divided into 10 to 20 communities).
2. On the national level, the coordination and supervision of the activities rest with the National Board of Health (SoS), while the Swedish institute of infectious disease control (SMI) is the expert authority that will provide the necessary information and scientific background to other actors. SMI also collects and analysis surveillance data, and runs research programs relevant to infectious disease control.
3. Each actor in its area of responsibility does preparedness planning for outbreaks and epidemics. In the case of an outbreak, the counties will coordinate the planning of their different actors. SMI will provide the scientific background for the work and initiate the necessary research whereas SoS will provide guidelines and coordinate the work at a national level. SoS will develop national plans in collaboration with actors at national and regional levels.

4. Recognition of outbreaks is a complex activity with many possible scenarios. The county medical officers will follow the epidemiological situation in their area. Close collaboration with other actors that can detect outbreaks will take place, including, of course, health care providers but also environmental health officers, veterinary services, and not least the media and the public. Similar collaboration, including similar partners with SMI as the node, will take place at national level. International contacts have become increasingly important in the last few years. Through contacts in the European Union (EU) and the World Health Organization (WHO) information on outbreaks which might affect Sweden is received both by SoS and SMI. These agencies will discuss whether any national measures are warranted.

5. The management of the outbreaks will - depending on the nature of the outbreak - involve a number of different actors. Central to the management from a public health perspective is the SmL who coordinates the response to the outbreak in its county. The health care sector is another important actor as well as the environmental health officers in the community, and others, depending on the nature of the specific outbreak. If the resources at county level are insufficient or if the outbreak involves several counties, national coordination is needed. SoS has the responsibility to coordinate activities of the counties whereas SMI will provide the necessary expertise. The SmL can furthermore request assistance from the newly formed Central field epidemiological team (CFG). If the outbreak has international aspects, SoS and SMI will coordinate with international bodies such as the EU and the WHO.

Animals

6. The rules for management of epizootic and zoonotic diseases in animals are laid down in the epizootic act and zoonotic act respectively. The epizootic act covers all A-listed diseases of the World organisation for animal health (OIE) and several diseases of the B-list as well (e.g. tuberculosis, brucellosis, rabies, paratuberculosis). The zoonotic act covers salmonella. In case of an emergency for diseases not included in the two acts, the act of sampling can be used. All diseases of OIE A-list and B-list are notifiable to the veterinary authorities.

7. The Swedish Board of Agriculture (SBA) is responsible for contingency planning and combating epizootic and zoonotic diseases. SBA employs about 300 district veterinarians. Sweden is divided into 21 counties and each county administration, and in particular the county veterinarians, has regional responsibilities. The National veterinary institute (NVI) is the national reference laboratory for animal diseases. A unit of NVI is providing expert help to SBA in the field of infectious diseases.

8. A veterinarian that suspects an outbreak of epizootic disease must, according to the epizootic act and the zoonotic act, notify the SBA and the county administration, and take samples in order to verify the disease. The animal owner must, also according to the act, accept this. The veterinarian must put restrictions on the herd if the suspicion is reasonable. An epidemiological investigation is carried out to find the source of infection and the possible spread to other herds. If the diagnosis is verified, the SBA declares the herd infected. The SBA has, according to the epizootic act and the zoonotic act, several measures to combat the disease with, including the stamping out of the whole

herd. The herd owner is compensated by the state for the value of the animals, costs for cleaning and disinfections, and for production losses.

9. In the case of a large-scale outbreak SBA will, with the help of the county administration, create regional centres to combat the disease.

10. As a member of the European Union, Sweden participates in meetings in order to create and revise rules for preventing and combating animal disease. Sweden also participates in the work of OIE.

Table of Some of the Main Actors in the System Described

Humans

Actor	Responsibility	Legal framework
SMI (Swedish Institute of Infectious Disease Control)	Expert authority	Communicable Diseases Act
SmL (County Medical officers)	In charge of infectious disease control in the county	See above
Health care system	Treatment of patients, tracing of contacts, reporting to SmL and SMI	Health Care act
SoS (National Board of Health and Welfare)	Supervisory authority, coordination of control activities	See above
Community environmental health authorities	Control microbiological contamination of food water etc	Environmental Code, Food Act
Arbetsmiljöverket (The Swedish Work Environment Authority)	Supervision of the employers protection of workers from communicable diseases	The Swedish Work Environment Act
Naturvårdsverket (The Swedish Environmental Protection Agency)	A central environmental authority. The main tasks are to co-ordinate and promote environmental work at both national and international level	Environmental Code
Livsmedelsverket (The National Food Administration, NFA)	The central supervisory authority for matters relating to food, including drinking-water	Food Act

Animals

Actor	Responsibilities	Legal framework
Swedish Board of Agriculture	Responsible for contingency planning and combating epizootic and zoonotic disease. Compensation to herd owners.	Epizootic act Zoonotic act
County Administration	Regional supervision	Epizootic act Zoonotic act
National Veterinary Institute	Diagnostics	Government instructions

Conclusion

11. The Swedish system for infectious disease control has worked effectively during the last decades with a decrease in the incidence of the most infectious diseases as the result. Naturally, this decrease is strongly linked to and influenced by other developments in Swedish society. In later years, the challenges to the system have been relatively minor with mainly smaller food borne outbreaks. The anthrax letters and SARS can be seen as tests of the system, even if they did not produce any cases. There is general agreement that the system handled these episodes fairly well. The experience has also helped push preparedness planning ahead: a smallpox plan is now available and a flu-pandemic plan is under development.

12. In other words, the structural capabilities to manage human outbreaks do to a large extent exist -with some weaknesses. Some of these weaknesses, which we share with many other countries, are that systems for the early recognition is not very well developed and surge capacities in the health-care systems are very limited. Natural outbreaks show that the management of smaller outbreaks works well but that capacities to handle big occurrences are not very well developed.

13. The structural capabilities to handle outbreaks of diseases in animals exist and work well for single and limited outbreaks. The challenge is large-scale outbreaks. During the last years, much work has been done in a project with participants from several authorities, including the police and the defence, how to handle large-scale outbreaks. Several weaknesses have been identified of which perhaps the most important are the lack of human resources and the lack of training.

EHEC¹ Outbreaks as a Scenario

14. EHEC in humans is mandatory reportable disease meaning that each clinician diagnosing the disease has to report the case to the county and national authorities as outlined above. The laboratory receiving human samples has the same obligation when they find EHEC. The clinician should investigate the source of the infection but usually the county medical officer does this instead. The SmL will investigate the source in close collaboration with other relevant local authorities such as the environmental health and veterinary services. If several cases are found and a national outbreak

¹ EHEC= enterohemorrhagisk e coli - a bacteria transmitted through food that causes kidney disease.

can be suspected, national authorities will become involved according to the responsibilities in table 1. SMI will analyse the bacteria found to detect if a common source is likely and epidemiologists will analyse the data collected about the patients.

15. The Swedish Board of Agriculture (SBA) gives general recommendations to the public on how to prevent the spread of EHEC. In the case of outbreak of EHEC in humans, which seems to be connected with animals, SBA delegates the investigation and the combating at the farm to the County administration. A district veterinarian is designated for the work at the animal farm. The County administration coordinates the sampling and action taken at the animal farm whereas the National veterinary institute performs the diagnostic on samples taken from the animals.
