Chapter 14
Public Health ICT Based Surveillance System

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ABSTRACT

The Public Health Surveillance System (PHSS) is defined as the ongoing, systematic collection, analysis, interpretation and dissemination of health-related data essential to the planning, implementation, and evaluation of public health practice. It serves as an early warning system, guides public health policy and strategies, documents the impact of an intervention or progress towards specified public health targets/goals, and understands and monitors the epidemiology of a condition to set priorities and guide public health policy and strategies. For this purpose, the PHSS should: be ICT-based and comprehensive with clearly defined sources, volumes, and standards of data; include all the stakeholders with information they produce, with enough flexibility in the dynamic of constructing indicators; be safe and able to produce information on demand and on time; and be able to act as a risk management system by providing warnings/reminders/alerts to prevent unwanted events.

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INTRODUCTION

The chapter is dealing with problems of acquiring information needed to make better public health decisions. Although some intuitive decisions can be made in public health and elsewhere, we believe that public health decision making should mostly be guided by the information gathered about the health system, health policy, and strategies, setting public health priorities, and taking actions to improve the health of the population. Being spread around a number of health institutions such as primary health care, hospitals, laboratories, etc., health data are not easy to link, to analyze, and interpret, and most importantly, there is often a delay in health data reaching the public health system, which hampers making quality, on-time decisions. Contemporary health information systems, although based on modern Information and Communication Technology (ICT), are often fragmented and unable to merge the information coming from various sources.

On the other hand, as a general rule, good decisions should be based on evidence, on information reflecting the reality. Which important decisions are made in health care systems? Whereas in developed or less developed countries, however a system is organized—based on primary health care (e.g. family practice is the "gate" of the health care system in some countries) or not, health care systems are exceedingly complex. Human resources or the health workforce are the core blocks of every health care system. Other health resources, material resources such as health technology, hospital beds, etc. are also very important, enabling the system to be effective and efficient. Diseases or health of individuals and populations are the major challenges for health care systems and the reasons for its existence. Answering the question of "how to handle the health care system to be good enough" requires knowing the system, having information about the system, using data processing or data mining techniques, and interpreting the results in the framework of harmony or excess in the health care system. Knowledge about the health care system (human and material resources, health status of the population, and relations between them) enables making better decisions in terms of management and planning.

The chapter's objectives can be described as: (1) what is public health, what is a surveillance system, (2) what should be kept under public health surveillance, and why, (3) what are the problems with existing public health surveillance systems worldwide, (4) proposals for the development of effective and efficient public health surveillance systems.

BACKGROUND

Definitions or "What is What"

Public health is defined as "the science and art of preventing disease, prolonging life and promoting health through the organized efforts and informed choices of society, organizations, public and private, communities and individuals" (Winslow, 1920). To be up-to-date and able to act in such direction, the public health is "crying" for information: its action should be based on evidence, and evidence is implied by data and information. Therefore, the continuous monitoring of population health, health care services, and effect of their actions and interventions has been needed. This means that a public health surveillance system is the inevitable tool for effective public health practice.

The concept of public health surveillance can sometimes be confused with other uses of the word surveillance. The Oxford English Dictionary defines surveillance as "close observation, especially of a suspected spy or criminal." The origin of the word is French, from *sur-* 'over' + *veiller* 'watch' (from Latin *vigilare* 'keep watch'). With regard to medicine, surveillance for long was considered as a branch of epidemiology, and was defined as close observation of persons exposed