The Role of Population Research in Disease Prevention and Management
Teaching a New Dog Old Tricks

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Summary

Disease prevention and management (DPM) represents a relatively recent paradigm shift in the provision of healthcare, from a focus on individual components of healthcare, to a more holistic view of patient care.

The purpose of this article is to provide practical guidelines that can be used in designing, implementing and evaluating DPM programmes. There are 6 steps in the design phase: (i) conducting an epidemiological diagnosis; (ii) reviewing the scientific literature; (iii) identifying the goal and outcome objectives; (iv) specifying strategy objectives and strategy activities; (v) selecting a study design; and (vi) considering the characteristics of effective outcomes measures. The implementation and evaluation phases include collecting the data, examining the data and reporting the results. Concepts and principles presented here are based on key methodological features of population research.
Disease prevention and management (DPM) is a relatively recent paradigm in the healthcare environment. DPM can be defined as ‘providing the right information, to the right decision-maker, at the right time’. The right information is the information necessary to make decisions regarding the optimal management of a patient’s health. The right decision-makers include the provider, patient and patient’s family. The right time provides the most recent information regarding the patient’s status and easy access to the information.

This article provides practical guidelines that can be used in designing, implementing and evaluating DPM programmes. Concepts and principles presented here are based on key methodological features of population research. Population research involves:

- the systematic collection of observations on the phenomena of interest in a defined population
- measurement of variables
- estimation of a summary value for one or more quantities of interest
- statistical testing to assess the extent to which chance may have accounted for the findings represented by the summary value.

The specific learning objectives are to:

- define primary, secondary and tertiary prevention
- distinguish among goals, intermediate outcome, and distal outcome objectives
- list the 4 components of an objective
- define an interrupted time-series design
- list approaches to minimise random and systematic error in data collection
- list the 4 threats to study validity
- list the 3 types of customers who receive DPM evaluation feedback.

1. Disease Prevention and Management (DPM): Design

There are 6 steps involved in the design of a DPM programme. The first step is called the epidemiological diagnosis. Here, it can be asked, ‘What is the magnitude of the health problem to be addressed?’ In the second step, (the literature review), the researcher asks, ‘Have interventions been developed that can work under ideal conditions with optimal resources, and in the real world under practical resource constraints?’

The third step (goal and objective specification) and fourth step (strategy objective and strategy activity specification) translate what was learned in steps 1 and 2 into programme direction. Finally, in the fifth step (study design selection) and sixth step (consideration of the characteristics of effective outcomes measures), a systematic approach to data collection is chosen. Each of these steps is described below.

1.1 Conduct an Epidemiological Diagnosis

The first step in designing a DPM programme is to conduct an epidemiological diagnosis. This quantifies disease burden and identifies population subgroups at particularly high risk of experiencing the health problem. Measures of disease burden can fall into 6 broad categories:

- morbidity (e.g. proportion of the population with disease, or prevalence)
- mortality (e.g. death rate)
- disability (e.g. school absence days)
- health resource utilisation (e.g. emergency room visits)
- quality of life (e.g. social functioning)
- societal costs (e.g. hospitalisation costs).

Measures of disease burden can be described for an entire population (crude measures) or for categories of the population defined by characteristics such as age, sex and race/ethnicity (category-specific measures). Crude measures are summary measures, while category-specific measures allow the targeting of particular segments of the population for prevention programmes.

1.2 Review the Scientific Literature

Once the impact of the disease condition has been assessed, the next step is to review the scientific literature. There should be reasonable scientific evidence that efficacious interventions (works under idealised conditions with carefully selected populations and with optimal resources) or effec-