A Guide to Designating Geographic Areas for Small Area Analysis in Public Health: Using Utah's Example

Guidelines and Resources for Health Data Organizations

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Introduction

This document offers a guideline for states to develop a small areas scheme for analysis of health data, using small area analysis framework. The author primarily draws from his experience of developing small area analysis at the Utah Department of health (see Haggard, Shah and Rolfs, 1999)[1]. The term 'small area' is used to imply areas that are large enough to have a sufficient number of events of interest to yield stable rates, yet they are small enough to unmask variations in the rates and still convey a sense of community.

Public health policy has increasingly emphasized local, or community health assessment and planning (American Public Health Association, 1991; APEXPH Steering Committee, 1991; Stano, 1993). These efforts are often hampered by a dearth of relevant and meaningful information about the current health status and needs of local populations. Understanding community health status at the small area level can help policy makers improve community public health planning. Several functions of small area analysis render analyses at this level useful at various levels.

Small area analysis has emerged as a useful tool in health services research over the last two or three decades, however, the history of its use is more extensive (see e.g. Glover 1938, as cited in Goodman and Green, 1996) It is a useful tool to describe how rates of health care use and events vary over meaningfully defined geographic areas. The tool has been used to investigate variation in the rates of hospitalization for a large array of diseases and surgical procedures including: chronic obstructive lung disease, pneumonia, hypertension, and in surgical procedures, such as hysterectomy, cholecystectomy, and tonsillectomy. Among the potential sources of geographic variation are differences in underlying morbidity, access to care, physician judgment, quality of care delivered, patient demand for services, differences in the supply of medical care resources, such as hospital beds, and uncertainty in the outcomes of different diagnostic and therapeutic procedures (Parchman,

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1995; Goodman and Green, 1996). Such use of small area analysis, can lead to improved medical care (Goodman and Green, 1996; Kazandjian and Hudson 1990).

A variety of methods are used in creating a small area analysis scheme in aggregating an appropriate number of persons into discrete geographic units below the state level. As stated by Haining, Wise and Blake (1994), in constructing small areas for the analysis of health data, the small area framework should enable the analyst to link health data and census data. Further, the areas should have large enough populations to ensure that rates are reliable and be homogeneous with respect to important socio-economic attributes.

Steps in Developing Small Areas

Developing a small area analysis scheme involves several steps, and each state may face different set of challenges in developing their own. The challenges will vary partially due to the **individual state's resource base** and **analytical capacity**, and partially due to availability of data and information necessary for these analyses.

The procedures outlined in this paper may be implemented with considerable variations. For instance, in Utah, race/ethnicity was not an important variable because most of Utah's population is Caucasian. There are no significant ethnic enclaves in any of the geographic areas. However, in some other states where race/ethnicity based subgroups are concentrated in reasonably large sizes, considering race/ethnicity as a criterion for grouping small areas may have been imperative. In sum, variations in individual states' methodologies are likely and even expected; this paper attempts to provide solutions based on Utah's experience.

1. **Obtain the population estimates for all administrative boundaries, understand your need:**

   The first step in the process of deciding small area boundaries is to understand the existing administrative boundaries. For this, population estimates for the most recent years are required for various levels of aggregation, such as five-digit zip codes, county, and districts. In theory, a state may already have an evenly distributed population across existing administrative boundaries such as counties. Alternatively, the urban zip codes may be roughly equal in size and may have a large enough population to serve as independent small areas; rural counties may be of appropriate size to be