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From the point of view of the urban policy-maker, research on social indicators has still failed to provide systematic reports on the social and physical condition of the metropolis. In fact, there are at least four distinct and major phases of indicator development that are in need of improvement, and I would like to take this opportunity to review each of them briefly. The first has to do with the development of certain basic information about the city; the second deals with the development of indicators that are usable in the framework of policy decisions; the third involves a topic not usually considered part of social indicators, i.e., the exploration of new policy options; and the fourth raises the question of the second-order effects of indicator systems.

Basic Information About The City

Despite the considerable attention given to social indicators over the last decade and the pioneering efforts of people like Eleanor Sheldon, Raymond Bauer, and Bertram Gross [1], we still have a little information about the quality of life in the contemporary American city. To be sure, no one expected that by this time there would be routine reports for value laden indicators like residential satisfaction. The difficulties of making precise measurements of social factors, added to the problem of making value judgments about what to measure and what constitutes an "improvement," both create a formidable barrier for any attempt at developing urban social indicators of this sort. However, any review of the existing information about cities will reveal that little is yet reported even about certain basic urban conditions. For instance, no matter what their value orientation, most people would agree that cities ought to have systematic reports on the following conditions:

-the total number of people -the number of people by age, sex, and race -the rate of population mobility -the health status of the population -the educational status of the population -the environmental safety of the neighborhood (including accidents, fires, and crimes) -family income

-the employment (and unemployment) of the population.

The reports should be available at least on an annual if not a monthly basis, and should be broken down to the level of small areas like census tracts. Such reports would be invaluable to citizens, researchers, and policymakers, and yet this type of information is virtually non-existent.

One possible reason for the failure to develop indicators of these conditions is that researchers have tended to lean too heavily on residential surveys as sources of information. Surveys include the national census, periodic urban surveys like the Detroit Area Survey (University of Michigan) or the Boston Area Survey (Harvard--M.I.T. Joint Center for Urban Studies), and special surveys. In general, however, surveys are too costly to be carried out frequently enough or with large enough samples of respondents to provide even annual small-area data for an entire city. As a remedy, what may be needed is a large dose of imagination and more exploration of two other sources of indicators: direct observations of street events, and municipal records. Both of these sources should be examined for direct measures of the urban conditions described as well as for indirect measures, or proxies of those conditions.

Direct observations of the street would involve the identification of certain events that may be unobtrusive signs of urban social conditions. For instance, abandoned cars, the number of people on the street, and drug and other retail stores are all easily observed and enumerated. Yet few investigators have examined the validity of these street indicators as proxies, say, for poverty, population, and health. Although considerable field work might be needed to assess these street indicators, once identified and validated they could easily be monitored by mobile research teams, policy-makers, or even residents themselves [2]. The final result would be a routine series of reports, produced at frequent intervals, and according to neighborhood locations.

Municipal records are those records maintained by municipal agencies. The records are often unreliable and in difficult-to-manage form. However, where these problems can be overcome, the records can serve as a potentially good resource for indicators because the information is usually recorded in sufficiently fine spatial and temporal detail. As a first step, several basic criteria might be used in determining the usefulness of the events in these records [3]:

-the events should be consistently defined; -the events should be discrete, with a known time of occurrence; -the events should be reported by very small geographic area; -the reported incidence of events should approximate the actual incidence; and -the events should be reported routinely and with as little delay as possible.

Researchers have tended to pay little attention to municipal records, and particularly to one indicator that most eminently satisfies all of these criteria, urban fire alarms [4]. For instance, Figure 1 shows the different alarm types for New York City. Each separate type of alarm tends to follow different statistical patterns, suggesting that each one could potentially be used as an indicator of different urban conditions.

Developing Usable Indicators

Assuming that basic information about the city were available through surveys, street indicators, or municipal records, a second major concern has to do with the shaping of the information into usable form. Usability, in this case, is defined strictly in terms of the needs of the urban policy-maker.

Generally, this means that the information should be accurate, timely, and brief. One prototype (and one of the few examples of an existing urban indicator) of the report needed is the Temperature-Humidity Index devised by the U.S. Weather Bureau. The Index is not intended as a measurement of weather conditions. Instead, it purports to record the amount of personal discomfort due to heat and humidity on any given day. Unfortunately, this Index is not reported for all urban areas, but where it is reported, the daily report provides highly relevant and timely information. In some cities, air pollution indices have also been devised and are now reported routinely [5].

Simple reporting, however, is not quite sufficient. The analyst must also give the policy-maker some sense of the degree to which an indicator deviates from normal. This means that, just as with the national system of economic indicators, the urban indicators must be seasonally adjusted or otherwise normalized. For fire alarms, for instance, the analyst would have to point out the expected seasonal patterns as shown in Figure 2. Interestingly, such seasonal patterns may underlie survey results as well, and replication studies as suggested in a recent indicator document will have to be designed with this possibility in mind [6]. As another example, the alarms also have persistent geographic patterns; Figure 3 shows the variation in small areas for the borough of the Bronx for a one-month period.

In addition, the analyst should also provide the policy-maker with substantive interpretations of the indicator. For instance, there has been a considerable amount of research on the topic of neighborhood change, and particularly residential turnover from white to non-white populations [7]. If such research showed the existence of critical points in the turnover process, then such points should be identified along with the indicator report. Another substantive contribution would be the identification of early warning signs of significant urban change, whether involving an incipient riot, neighborhood abandonment, economic shifts, or urban renovation [8]. Many have hypothesized, for instance, that a rise in false fire alarms in a neighborhood is an early sign of large population turnover, primarily from middle-income to lower-income families. In short, policymakers would benefit most from an indicator system that not only provides the essential information but also identifies the potential repercussions of indicator change.

The final key to a usable set of indicators is a well-designed, computer-based information system. Much has already been written about urban information systems, most of it belaboring the obvious points concerning system design and programming talent [9]. The main reason for a computer-based system is simply that, for the large American city, the number of relevant incidents is usually large and the calculations required for various indices are complex, but the data must be reported as quickly as possible. Hence there is ample justification for creating a computerbased urban indicator system.

Exploration Of New Policy Options

The third major concern in the use of urban indicators is not one that is normally regarded as part of the development of social indicators. This concern does not involve the creation of new and usable information as much as it involves the development of new types of program options that are available to the policy-maker. In short, urban social indicators must be created hand-in-hand with new urban programs and responses.

Why should this be a part of the indicator job? The answer is related to the problem of making value judgments in indicator research. As Moynihan has written, social indicators in general are likely:

> ...to be developed by professors and government executives who will be far more concerned with what is bad about cities than with what is good about them. These men will judge good and bad in terms of their own rather special values acquired in the course of family, religious, educational, and occupational experiences that, by and large, are quite different from those of the urban masses whose condition they will seek to measure [10].

Thus much care must be exercised in deciding what should be measured and how changes in indicators should be interpreted. By now, most people have been sensitized to the problem, although adequate means for dealing with implicit value judgments have not emerged.

However, the very creation of an indicator series is also a prejudicial step if only one response action is available to the policymaker. For instance, supposing an investigator were asked to develop an early warning system for urban riots, and such an indicator actually came into existence. At the present time, most mayors have only one recourse in a riot situation: summoning control forces and preventing or combating the riot. Under such conditions, the early warning system has therefore become not only a riot indicator, but it has also become an instrument of riot suppression. Similar cases can be made for crime indicators, or any indicator concerning the formation of youth gangs. In each case, if there is only one response available to the decision-maker, the indicator becomes an unwitting partner of a fixed urban policy action.

In order to create a usable and less biased series of urban indicators, analysts must therefore also develop new policy options for the decision-maker. In the case of urban riots, other options could involve peaceful street negotiations, perhaps by the mayor himself, or the development of other emergency contingencies to help rectify whatever immediate situation is leading to the riot. Perhaps even more important, longer-term follow-up programs could be considered to provide more meaningful and permanent improvements. It should be pointed out that the development of new programs and options is a very complex affair, in that the programs often have unintended consequences [11], but that in spite of these difficulties the development of new options should be an integral part of the development of new indicators.

Second-Order Effects Of Indicator Systems

The need to develop new policy options is actually but one example of a whole class of broader second-order concerns [12]. Where reliable indicator systems are developed, in other words, policy-makers and citizens may both pursue new courses of action as a result of the new indicator information. The policymaker, as has been pointed out, can use his existing program options more effectively.

The citizen, however, can also change his preferences and activities because of the indicator. An obvious example involving the citizen would derive from a crime indicator system. If crimes and perceived safety were routinely reported for different neighborhoods, citizens might then be better forewarned to protect themselves and their property. On the other hand, the routine crime reports might also serve to accelerate residential relocation from high-crime to low-crime neighborhoods, and such movement (since it would be selectively limited to the families that could move) might leave the high-crime neighborhood vulnerable to even more crime. The indicator reports themselves could thus have both positive and negative effects.

The development of social indicators therefore entails the serious risk that conditions can be aggravated simply because of the fact that indicators have been created and reported. These second-order effects could be entirely undesirable, and could be avoided if the indicators were not reported in the first place. The researcher engaged in developing social indicators must consider the possible second-order effects of his indicator system, and weigh the likely advantages and disadvantages of the system. Naturally, this decision-making process will involve another set of value judgments, and more research is needed to determine the appropriate criteria for recommending which indicators on a certain topic be developed or not be developed.

Summary

In summary, the researcher who attempts to develop meaningful and useful urban indicators is faced with several problems beyond the normal methodological concerns of statistical validity and reliability. First, he must locate a good information source for ' indicators, knowing that at present there is very little known about basic urban conditions, even on such essential matters as the overall population or the population's mobility, health, or income. The main suggestion here has been that researchers give more attention to the use of street indicators and to municipal records, and less attention to the use of residential surveys, which tend to be cumbersome and unresponsive to the policy-maker's needs for timely decisions on a small-area basis. Second, the good analyst must not only provide indicator data in a compact and usable form, but he must also carry out relevant analysis on indicator trends so that he can tell the policy-maker when indicator changes represent significant deviations, and what changes may be important as critical points or as early warning signs. Finally, the analyst must also keep in mind the potential second-order effects of the creation of indicator systems. These include the development of new policy options to go along with the creation of new indicators, so that the indicators do not automatically become instruments of single public policies. The second-order effects also include the judgment

that urban conditions will not be aggravated simply as a result of the existence of the indicator information.

These requirements perhaps pose a formidable agenda for the researcher. However, the requirements must be met if urban indicators are to share any part of the reality of the American city in the nineteenseventies.

NOTES

- Eleanor Bernert Sheldon and Wilbert E. Moore (eds.), <u>Indicators of Social</u> Change: Concepts and Measurements (New York: Russell Sage, 1968); Raymond A. Bauer (ed.), <u>Social Indicators</u> (Cambridge: M.I.T. Press, 1966); and Bertram M. Gross (ed.), "Social Goals and Indicators for American Society," <u>The Annals</u>, 371 (May 1967) and 373 (September 1967).
- For further discussion on the development of street indicators, see Robert K. Yin, <u>Participant-Observation</u> and the Development of Urban Neighborhood Policy, The New York City-Rand Institute, R-962, April 1972.
- 3. One can use these (and other) criteria to compare the potential usefulness of available records, like reported crime, school enrollment, the incidence of mental illness, etc. See Robert K. Yin, "The Development of Social Indicators: The Case of Fire Alarms," paper presented at the Eastern Sociological Society annual meeting, April 1972, Boston, Massachusetts.
- For a description of the potential interpretations of fire alarms, see <u>Ibid</u>.
- 5. It is interesting to note that the few urban indicators that have been attempted (e.g., the Temperature-Humidity Index, air pollution indicators, and noise pollution indicators) are all psychological, and not social indicators. In other words, the information relates the urban environment to the needs of the individual citizen, but no assessment has been maue of his social activities.

- 6. Otis Dudley Duncan, <u>Toward Social Reporting: Next Steps</u> (New York: Russell Sage, 1969). For one of the few studies that has dealt with the seasonal factor on a social issue, see William Michelson, "Some Like It Hot: Social Participation and Environmental Use as Functions of the Season," <u>American Journal of Sociology</u>, 76 (May 1971), 1072-1083.
- 7. For instance, see Morton Grodzins, <u>The</u> <u>Metropolitan Area as a Racial Problem</u> (Pittsburgh: University of Pittsburgh Press, 1958); Davis McEntire, <u>Residence</u> <u>and Race</u> (Berkeley: University of California Press, 1960); Eleanor P. Wolf, "The Tipping-Point in Racially Changing Neighborhoods," <u>Journal of the</u> <u>American Institute of Planners, 29</u> (August 1963), 217-222; and Harvey Molotch, "Racial Change in a Stable Community," <u>American Journal of Soci</u>ology, 75 (September 1969), 226-237.
- For example, see Joan E. Jacoby, "The Neighborhood Early Warning System--Design and Development," <u>Socio-Economic</u> <u>Planning Sciences</u>, 4 (1970), 123-129.
- 9. Two discussions that not only cover some of the technical requirements but also raise important social and political issues are: Edward M. Goldberg, "Urban Information Systems and Invasions of Privacy," <u>Urban Affairs Quarterly</u>, 5 (March 1970), 249-264; and Edward H. Blum, "The Community Information Utility and Municipal Services," The New York City-Rand Institute, P-4781, February 1972.
- Daniel P. Moynihan, "Urban Conditions: General," <u>The Annals</u>, 371 (May 1967), 159-177.
- 11. One of the few analytic models of the longer-term effects of urban programs can be found in Jay W. Forrester, <u>Urban Dynamics</u> (Cambridge: M.I.T. Press, 1969).
- 12. The question of second-order consequences has been explicitly raised primarily in relation to new technological changes. See Raymond A. Bauer, <u>Second-Order</u> <u>Consequences: A Methodological Essay</u> <u>on the Impact of Technology</u> (Cambridge: M.I.T. Press, 1969).



Figure 1

WEEKLY NUMBER OF FIRE ALARMS IN NYC 1964 - 1969



Figure 2

FALSE ALARMS BY HEALTH AREAS

THE BRONX

JANUARY 1970



Figure 3