
INEQUITY IN HEALTH
A CASE STUDY

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This article presents a particular case of inequity in health, that of two types of Israeli urban settlement: development towns and veteran towns.

Inequity in health is demonstrated by the varying levels of resources allocated to each type of community, by the differences in health-care utilization (process), and by the diversity of external factors affecting the two categories of towns. Despite the existence of almost universal health insurance coverage in Israel, it is shown that inhabitants of less privileged development towns are more prone to inequitable health outcomes with respect to the wealthier populations living in veteran towns.

This case illustrates an integrated approach to inequity in health, including the health-care system structure, utilization patterns, and the socio-demographic-economic background of different strata.

INTRODUCTION

Unfortunately, equitable health care goals are rarely met. Indeed, various authors have noted the multiple factors leading to inter-group variations in health-care utilization as well as to the different outcomes of such uses (2, 9, 10, 19). Other studies have discussed inequities in provision of health-care facilities, personnel and procedures (1, 7, 17, 19). Additionally, it has been shown that the interaction of care-seekers with the system varies between groups (16). Perhaps the most integrated approach is that of the Black Committee Report (18) which discusses how the British health care system has manifest patterns of inequality in access to, and in the structure of, health care as well as in trends of utilization and in health outcomes within the context of poverty and class structure. The report also notes cost-oriented pressures towards greater equalization of health care

in the NHS, aside from subtly encouraging the development of private health care in Britain.

Despite the existence of virtually universal health insurance coverage in Israel, an extremely high physician: population ratio (1: 410), and relatively small distances between health care centers and the population, there is selective evidence for inequity in health in the country (16). A more integrative approach would require the assessment of varying levels of resources allocated to different sectors, of uneven care processes, of diverse external factors affecting the various groupings, and of the influence of differential needs on health outcomes. In search of a case study which might reflect these integrative aspects of inequity, we were prompted to examine two types of urban settlements in Israel: veteran towns and development towns. These two types of towns correspond to two fairly homogenous strata of Israeli society. While veteran towns consist largely of well-established populations, development towns were the sites of geographic settlement and the subsequent "melting pots" of the immigrant waves from various

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countries during the 1950's and 1960's. Consequently, not only do the two types of towns' social demographic profiles differ, but health indicators, such as infant mortality, or cause-specific death rates, are also unequal. Though the case study deals with a somewhat unique situation, the general principles are relevant to virtually all health care systems: that determination of inequity in health subsumes examination of the health care system structure, access to it, utilization patterns, and the socio-economic background as well as health outcomes. A more thorough examination of the theoretical background pertinent to the case description is presented in an earlier article (8).

METHODS

Information regarding residents of development and veteran towns was obtained from the parallel 1981 "Labor Force" and "Use of Health Services" surveys, conducted by the Central Bureau of Statistics in Jerusalem (3, 4).

A total of 21,280 individuals were interviewed in 6,191 households across the country for demographic, occupational and health services-use data. As the sample was a two-stage cluster design, only one adult of each sex from each household was included in our analysis to simulate random, independent samples. Therefore, 5,731 individuals, 1,700 living in development towns and 4,031 living in veteran towns were extracted for the purposes of this study.

Other major sources of information included the "Profile of Health Services in Israel", where preventive and ambulatory services were surveyed by settlement (12), and the "Social Profile of Cities and Towns in Israel" (13).

Standard data manipulations to create cross-tabulations were performed using an SPSS package. Tests of statistical significance included z-tests for difference in proportions of variables; t-tests for evaluating differences and outcomes between the two types of towns; and SMR-type "age-ratio" to determine whether age-adjusted utilization rates were significantly deviant from expected rates of usage based on the age structures of specific groups.

RESULTS

Socio demographic profiles of development and veteran towns

Table 1 presents the profiles of the two types of towns. Veteran towns are, on the whole, twice as large as development towns in this sample, with a somewhat older age structure. The percentage of residents of Asian-African origin (those born in Asia-Africa or their immediate descendants) is higher in development towns - 53.6% as compared to 28.0% in veteran towns - and the average educational level is

lower than in veteran towns: only half of those in development towns have nine years or more schooling, while over two-thirds of those in veteran towns have similar education and over 25% have some university background. Development town families are more likely to have more children per family, occupy denser housing and have a head-of-household occupied in a non-professional occupation. They are also generally insured by the General Sick Fund, a pre-paid health insurance scheme, affiliated with the influential labour union federation, rather than with the other, smaller sick funds (Maccabi, United, National).

Health resources (structural inequities)

Table 2 illustrates the physician rates per 10,000 population, both for total population and for those insured in specific sick funds, as well as the statistical significance of the differences in rates between the two types of towns and personnel/ population ratio. In development towns, there are, on the average, significantly fewer primary care physicians and specialists per 10,000 population, and fewer pediatricians per 10,000 population aged 0-14 years; this is true whether the denominator is the total population or when dividing each fund's physicians by the population insured in that fund. In order to account for the lack of non General Sick-Fund services in most smaller development towns, towns with zero cells for health personnel were not included in the calculations. When translated into ratios of personnel per population, the implications become clearer: for example, in the General Sick Fund alone, there is a primary care physician per 2,381 insured in development towns, versus 1: 2,041 in veteran towns, an excess load of 340 patients per practitioner. On the other hand, the nurse per population ratio, calculated for the entire population, is higher in development towns than in veteran towns.

As an examination of whether the small size of the development towns militates against the placement of health care resources, Table 3 breaks down the settlements by size and by presence of various services. For example, non General Sick Fund physicians are found in all towns with a population above 30,000, but smaller towns, largely development towns, have fewer. This is also true of hospitals and of preventive screening facilities. However, within each town-size-category, there are differences between the two types of towns which are not totally controllable by size.

Utilization of health services (process inequities)

Age standardized visiting rates are shown in Table 4. There are three discernible types of utilization patterns: services with utilization rates significantly higher in development towns (primary care, hospital care); services with lower rates in development towns as compared to veteran towns (specialist visits, dentist

Table 1. - Socio-demographic profiles of development and veteran towns in the study sample.

	Development Towns 31	Veteran Towns 24
No. of towns in sample		
Mean 1981 population	20,201 (SD=21,325)	52,315 (SD=43,209)
% of population living in towns*		
less than 10,000 residents	9.7	0.8
less than 100,000 residents	87.5	40.0
% Located within 25km of a major city***	38.7	95.8
% aged 0-14 years**	36.7	30.1
% aged 65+ years**	5.7	8.2
% Continent of origin***		
% Asia-Africa	53.6	28.0
% European-American	28.9	42.0
Israel	12.6	29.9
Other	3.8	0.3
% Education***		
0 years	12.6	4.1
1-18 years	36.8	27.3
9-12 years	37.2	42.4
13+ years	13.3	26.2
% Occupation (male heads of household)***		
Professional, managerial	15.7	27.7
Clerical	26.7	29.0
Skilled/unskilled labor	52.7	40.1
Agriculture	4.9	1.7
% Number of children per household***		
0	39.1	45.6
4+	10.7	4.7
% Housing density***		
More than 2.5 persons/room	7.4	4.3
% Sick Fund membership***		
General Sick Fund	89.1	74.0
Other sick funds	7.7	21.6
No insurance	3.2	3.9
% Mean delinquency rates****	7.6	4.9
% of local budget allocated to welfare assistance*****	14.1	9.1

Adapted from:

* List of Localities, Populations and Codes, Israel Bureau of Statistics Technical Publications Series N. 50, Jerusalem, 1981.

** Profile of Health Services, Survey of Preventive and Ambulatory Service 1978, Ministry of Health, Jerusalem, 1979.

*** Labor Force Survey, 1981, and Use of Health Services Survey 1981, raw data, Central Bureau of Statistics, Jerusalem.

**** Major cities (population over 250,000) are Jerusalem, Tel-Aviv, Haifa.

***** Social Profile of Cities and Towns in Israel, Ministry of Labor and Social Affairs, Jerusalem, 1979.

Table 2. - Health personnel to population ratios for development & veteran towns*.

	Percent of towns with existing facilities		Personnel: population insured for non-zero towns only		Significance of difference**
	Development	Veteran	Development	Veteran	
PRIMARY CARE PHYSICIANS					
Total physicians			1:2326	1:1852	<0.001
Physicians in sick funds:					
General	100.0	100.0	1:2381	1:2041	<0.01
Maccabi	29.0	83.0	1: 444	1: 633	n.s.
United	16.1	58.3	1: 746	1: 714	n.s.
National	35.5	66.7	1:1493	1:111	n.s.
SPECIALIST PHYSICIANS					
Total physicians			1:6667	1:3448	<0.01
Physicians per insured populations:					
General	83.9	79.2	1:7143	1:4545	<0.10
Maccabi	19.4	75.0	1: 467	1: 763	<0.10
United	9.7	54.2	1: 917	1: 633	n.s.
National	25.8	58.3	1: 820	1:1190	n.s.
PEDIATRICIANS (per 10,000)					
Total physicians			1:2128	1:2999	<0.001
Physicians per insured populations:					
General	90.3	95.8	1:1961	1:1613	<0.10
Maccabi	12.9	70.8	1: 338	1: 472	n.s.
United	6.5	45.8	1: 383	1: 451	n.s.
National	25.8	66.7	1: 431	1: 746	<0.05
NURSES (per 10,000 total population)			1:471	1:1695	n.s.

* Adapted from "Profile of Health Services in Israel, 1979).

** 2-sided t-test for difference between development and veteran towns; (31 development & 24 veteran towns).

Table 3. - Settlement size and health care resources*

Population (1977):	>15,000		15,000-30,000		30,000-70,000		70,000+	
	Devl.	Vet.	Devl.	Vet.	Devl.	Vet.	Devl.	Vet.
Number of towns in category (Total, 31 devl., 24 vet.)	19	5	9	7	2	5	1	7
% with non-General Sick Fund physicians								
Primary care	21	60	78	100	100	100	100	100
Specialist	5	40	56	100	100	100	100	100
Pediatrician	5	20	67	100	100	100	100	100
% with local hospital	5	40	22	43	0	60	100	86
% with first-aid station	42	60	78	43	100	80	100	72
% with Breast Cancer Detection Center:								
	0	40	11	43	0	60	0	100

* Adapted from "Profile of Health Services in Israel, 1977".

Table 4. - Age standardized utilization in development and veteran towns*

	Age-adjusted percent visited		Age-ratio**		Significance of age-ratio***		Female: Male ratio	
	Devel.	Veteran	Devel.	Veteran	Devel.	Veteran	Devel.	Veteran
1° care visit:								
Male	25.8	20.1	1.21	0.94	<0.02	n.s.	1.45+	1.43
Female	35.6	29.8	1.16	0.97	<0.01	n.s.		
Specialist visit:								
Male	4.2	5.5	0.64	0.84	<0.01	n.s.	3.00+	1.90+
Female	14.8	12.3	1.08	0.90	<0.10	<0.10		
Visit to dentist:	7.2	10.0	0.66	0.91	<0.001	<0.05	1.34	1.74+
Hospitalization	8.8	5.7	1.26	0.81	<0.01	<0.001	0.61+	0.78+
Cancer Detection Center:	16.3	25.7	0.75	1.18	<0.001	<0.0001		
Emergency room:	2.2	1.6	1.44	1.05	<0.05	n.s.	1.25	1.10
Housecalls:	2.3	1.6	1.44	1.00	<0.05	n.s.	1.66	1.09
Laboratory tests:	7.5	7.1	1.11	1.04	n.s.	n.s.	2.48+	1.76+
X-rays:	2.9	2.7	1.12	1.03	n.s.	n.s.	1.66	1.17
Visit to nurse:	6.2	3.8	1.02	0.67	n.s.	<0.001	1.41	1.24

* Source: "Use of Health Services Survey", 1981, raw data, Central Bureau of Statistics, Jerusalem. Percent visiting during that time period.

** Time periods: 2 weeks for all services except for last 6 months for hospitalization and at any point for Breast Cancer Detection Center.

*** z-test for difference of means, 2 sided;

+ Significant at $p < 0.05$.

visits, preventive care); and services which were essentially similar in the two types of town (housecalls, laboratory tests, x-ray and emergency-room visits).

The "age-ratios" of Table 4 are SMR-type figures, indicating whether utilization was higher or lower than expected given the agestructure of the adult population of each category of town; the outstanding examples are male specialist visits and pooled dental visits which are about two-thirds of the anticipated levels in development towns; hospitalization, which is higher than expected in development towns; and visits to Breast Cancer Detection Centers, which are significantly lower in development towns and higher than expected in veteran towns. However, only 1 of 31 development towns has a Cancer Detection Center, while 15 of 24 veteran towns have such a center (13).

Female/male ratios were in the same direction in both development and veteran towns, though the gap was generally greater in development towns. This is especially notable for cases of specialist visits and laboratory tests (3.00 to 1.90 and 2.48 to 1.76 for the two services in the two types of towns, respectively).

DISCUSSION

Structural inequities

We first examined structural inequities. In this respect, development towns include among the most disadvantaged elements in Israeli society, while

veteran towns are largely middle- and upper-class, including those who have "drifted up" from development towns. As the latter are on the average, less than half the size of veteran towns, and as they are further from centers of population, it is not surprising that there are generally - with the exception of nurses - fewer health personnel and facilities per population. Moreover, as utilization rates and services are higher in development towns, there is a heavier case-load for practitioners there. On the other hand, the ratio of specialist to primary care physicians, an index of post-primary health care sophistication, is higher in veteran than in development towns. This is particularly noticeable since the figures do not include the private sector, which is usually staffed by physicians who are also employed by the smaller sick funds or by hospitals, and who are largely absent from development towns.

As in smaller settlements (such as development towns), the General Sick Fund physicians are often the only professional health personnel and must also operate emergency services, preventive care in Family Health Centers, occupational health and other duties - the lower ratios of personnel to population in veteran towns are even more beneficial than the figures would indicate. In the towns with limited populations, the physician attends clinics only on certain days and the nurse is the primary care practitioner in his absence. Therefore, it is not surprising that nurse/population ratios are more favourable for development towns.

Factors involved in physician location include

income potential, climate, geography, background, opportunities for social life, the educational system, family pressures and others (11). For such reasons, a large proportion of physicians practicing in veteran towns reside in them, while those in practice in development towns usually live in other settlements (Israel Medical Association, 1982) and are not available outside of office hours, as noted in a study of a typical development towns (15). Similarly, the rate of dentists per 10,000 population ranges from 2.07 and 3.11 in the Northern and Southern districts, where most of the development towns are located, to 4.66 in the Central and Tel Aviv districts, which include many of the veteran towns (14). The General Sick Fund, which maintains most of the clinics in development towns, attempts to fill posts on ideological grounds. However, as it is operating against local disadvantages, both the quantity and the quality of health care suffer. The list of physician characteristics includes high numbers of physician-patient contacts, over-referrals and over-prescribing of drugs.

Physicians in development towns tend to be older and generally foreign-born without hospital affiliations. Although there are exceptions, such as development town physicians who are recent graduates and often specialists in family medicine. Services outside of primary-care clinics are frequently lacking: public health facilities, including Breast Cancer Detection Centers or hospital-based colorectal cancer screening programs, are rarely found in development towns; neither are Ministry of Health sub-stations, occupational health centers (despite the large number of industrial sites in development towns), child development stations, or mobile cardiac resuscitation units (12).

The lack of such post-primary facilities becomes more acute distance-related barriers are examined. While within the compact development towns there are few difficulties in reaching primary care, access is limited by distance to secondary diagnostic centers, hospital-affiliated outpatient specialty clinics, treatment stations and other ancillary services located largely in the urban centers. Twenty-three out of twenty-four veteran towns are within twenty-five kilometers of a major city, whereas only twelve of thirty-one development towns are as close (see Table 1). As development town residents are less likely to own a private vehicle, travel to diagnostic, treatment and rehabilitation may involve several hours on public transport and present substantial barriers to obtaining quality health care.

Process (utilization) inequities

Utilization of health services has important implications: as a reflection of need – presumably through the action of the individual's mediating factors; as a pointer to access and availability; and as an indicator of process.

The age structures of the study population are not radically different among veteran and development

towns, though the development towns do have a somewhat younger and more fertile population: therefore, conclusions drawn from crude and age-adjusted utilization rates are essentially similar except for conditions which prevail among the elderly. Highly need-dependent services, such as X-rays and laboratory tests, do not greatly differ between the two towns; nor do housecalls and emergency-room visits, though the small number of visits might not allow for differences to become visible. On the other hand, primary care and hospitalization are significantly higher in development towns, while other services (preventive screening, dentist care, specialist visits) were higher in veteran towns.

There are a number of possible sources for the striking differences between the two types of settlements, particularly in primary care and hospital care utilization. While differences in self-reporting are possible and have been related to increased age, frequent utilization, membership in pre-paid plan, health status and health beliefs (5), they are unlikely to play a central role in explaining the variations. The most powerful influences on utilization, age and sex, are not very dissimilar between the adult populations of the two towns, though cultural factors are probably responsible for the somewhat higher female to male visiting ratios found in development towns as compared to veteran towns.

Occupational classes do differ between the two types of towns, and it is possible that industrial work-related accidents and exposures account for some of the increased hospitalization and primary-care attendance in development towns. However, the large proportion in both types of towns of clerical workers assures that such factors are not major ones. In Israel, socio-economic class is not necessarily related to occupation, as there are often secondary sources of income which may paradoxically provide those of lower occupational status with higher incomes. There is increased unemployment in development towns, as well as welfare dependency rates, which has been observed to act on morbidity (6) and is also likely to place an overall burden on the town's social structure. The ethnic compositions of development and veteran towns are quite dissimilar, as are the educational levels. Ethnicity can be expected to operate both independently, in terms of health beliefs and through its correlation with education (and thus with socio-economic status). Age-adjusted visiting rates show that development town residents visit primary care more often, and dental/preventive care less frequently. This is correlated to the different ethnic compositions in the types of settlements (Table 1). Similar trends are noted for those with less education as is the case for many development town residents.

There are a number of other variables, such as the number of children, housing density, number of rooms in the residence and geographical district which are related to utilization of medical care on a whole-country basis. Those variables also differ between development and veteran towns. However, they are in

most cases strongly correlated with education and origin and therefore not analyzed separately.

Another major difference between the two types of settlements might be attributed to the patterns of health insurance or to styles of practice (clinic versus office-based visits) and to the quality of care rendered. Waiting time, reimbursement arrangements and requests for authorization of sick leave and various social welfare benefits vary between the General Sick Fund and the smaller sick funds, in line with the sick funds' management and educational or occupational backgrounds of their clientele. As described (16), the latent functions of the Israeli physician are perhaps as central to his patterns of practice as are his manifest functions, with their expected effects upon his self-image, and his delivery of care. Related problems are most acute for the physicians employed by the General Sick Fund, supplier of almost all health care to development towns.

Inequities in outcome

In terms of health outcome, there is evidence in the literature that age-specific death rates, infant mortality, cause-specific death rates and, as a developmental indicator, birth rates are higher in development towns than in veteran towns (12). A similar trend is shown in hospitalization rates for certain infectious diseases (9, 10). The crude death rate is somewhat higher in veteran towns, due to the older age structure of the population; however, age-specific rates are higher in development towns for all age groups.

Also, perinatal and infant death rates are significantly increased in development towns as compared to veteran towns. Birth rates, both crude and age-specific, are higher in development towns than in veteran towns, most markedly at the socially and medically problematic maternal age extremes of 15-19 and 45-49 years (12).

In addition, one can note several external factors operating directly on the outcome which also possibly lead to inequity in health. For example, Table 1 shows that the physical environment in development towns is characterized by higher crowding, while the social environment in these towns presents higher delinquency rates and larger proportions of local budgets allocated to welfare assistance and social support. Therefore, these external factors add to other influences in predisposing development town residents towards a poorer health outcome.

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