

Problems of health following the industrialization of underdeveloped areas¹

by *W. Strauss*²

Summary

Certain features within Israel's process of industrialization may have something in common with the situation in developing countries and lessons drawn from its experience may be of use to other lands.

During periods of dynamic industrial development the principles for the maintenance of health within the working population, so well known today, are easily forgotten. Misleading consolation is drawn by terming such periods as "temporary". Since industrialization is the driving power behind urbanization, limited, well planned urbanization on the one hand, and dispersion of industry among small cities and/or rural settlements on the other, seem to be the most important steps to counter the ill-effects of uncontrolled urbanization. In this respect the industrialization processes going on in rural areas in Israel, especially in communal settlements, are encouraging undertakings.

From the medical as well as from the social point of view the importance of an industrial health program right at the beginning, is emphasized. Well staffed industrial health centres are advocated as seemingly the best means for the administration of medical care in industry in developing countries.

Zusammenfassung

Gewisse Aspekte des Industrialisierungsprozesses in Israel dürften mit der Situation in Entwicklungsländern gemeinsame Züge aufweisen. Die spezifischen Erfahrungen Israels auf diesem Gebiete könnten daher auch für andere Länder von Nutzen sein.

Während Perioden rascher industrieller Entwicklung werden die heute allgemein bekannten Prinzipien zur Gesunderhaltung der arbeitenden Bevölkerung leicht außer acht gelassen. Ein falscher Trost ist es, wenn man solche Perioden als «temporär» ansieht. Die treibende Kraft zur Urbanisierung ist die Industrialisierung. Um unerwünschte Effekte einer unkontrollierten Urbanisierung zu vermeiden, drängen sich als Maßnahmen auf: Eine Begrenzung und sorgfältige Planung der Urbanisierung auf der einen und eine Verteilung der Industrie auf kleinere Städte und ländliche Ansiedlungen auf der anderen Seite. In dieser Hinsicht berechtigt der Verlauf der Industrialisierung in ländlichen Gegenden Israels zu optimistischen Erwartungen.

Die Wichtigkeit der Einrichtung eines Gesundheitsschutzprogrammes für die Industrie, und zwar vom ersten Beginn der Industrialisierung weg, wird ebenso vom medizinischen wie vom soziologischen Gesichtspunkt aus hervorgehoben. Materiell und personell gut ausgerüstete Gesundheitszentren in der Industrie scheinen den besten Weg zur medizinischen Betreuung in Entwicklungsländern darzustellen.

¹ Report submitted to the 1. International Conference: Living Conditions and Health in the Mediterranean and Black Sea Basin, Palermo, 17-20. X., 1963.

² Address: Prof. *W. Strauss*, Department of Preventive Medicine, the Hebrew University-Hadassah Medical School, Jerusalem, Israel.

Since the only developing country I have ever lived in is Israel, I am somewhat hesitant to share in a discussion, the object of which being to give friendly counsel to those countries whose fortunes are linked – more or less – with the success of their industrial revolution. On the other hand, in spite of all the differences between these countries and Israel, there are certain features within Israel's process of industrialization that have something in common with the situation of the developing countries so that some lessons drawn from our experience may be of some use to other lands.

In considering the dangers to health following industrialization in developing countries, a point of general validity should not be overlooked, namely, the deplorable possibility that advantage will not be taken of the vast experience accumulated by the industrial societies of the world. The gloomy picture drawn in the abundant social and medical literature regarding the disastrous effects on the health of the population during the first industrial revolution, when urban centres grew through unchecked, unrestrained influx of people, into monstrous cities, the hideous metropolises of today should not be forgotten. It may serve as a memento forever and for all. To counter any possible disregard of the human factor in the process of industrialization, full use should be made of the fundamental principles of modern Public Health, the scope of which is best expressed in the words of Winslow¹: “Public Health is the science and art of preventing disease, prolonging life, and promoting health and efficiency through organized community effort for the sanitation of the environment, the control of communicable disease, the education of the individual in personal hygiene, the organization of medical and nursing services for the early diagnosis and preventive treatment of disease, and the development of the social machinery to insure everyone a standard of living adequate for the maintenance of health, so organizing these benefits as to enable every citizen to realize his birthright of health and longevity.”

This definition, a scrupulous interpretation of modern knowledge about the manifold factors influencing the state of health should always be used as a yardstick to measure conditions of life for our population. Theoretically, it seems easily applicable at the start of a fresh development. But we have learnt that in a dynamic, sometimes turbulent stage of progress, the health aspect is often forgotten. What is worse, even the medical profession, instead of stressing this point over and over again, very often does not realise its importance and the relatively few specialists in the field of Public Health lacking the support of a strong medical public opinion, are fighting a losing battle against more powerful authorities. The idea that a bad situation is only temporary may be comforting, but is misleading. Such “temporary” or “transitional” periods may last long, may even become permanent. In any case

¹ *Winslow C.E.A.*: The evolution and significance of the modern public health campaign New Haven (1923).

they will be extremely difficult to improve, if times change for the better. How much suffering of population groups could have been avoided or lessened if more attention had been paid in such “dynamic”, “temporary” situations to environmental factors, detrimental to physical and psychical health.

I felt obliged to start with this excursion into the sensitive field of medical politics, since this was and still is one of the basic problems in Israel. I hope we will agree that we are on the way to a new appraisal of the doctor’s position in his community, which will force him to emerge from his professional isolation and to exert his influence in the control of environmental dangers to health which otherwise may well escape the attention of the technical forces responsible for industrial development.

This help is especially necessary if we consider the problem of urbanization through industrialization in a formerly rural area. Indeed, if we look at the results of the urbanization process in the gigantic cities, if we reflect on their perpetual endeavour to build wherever possible in order to compensate the population for the lack of decent living quarters, caused by fatal errors of former times, the public health outlook of urbanization in developing countries may be considered fairly grim. But I do not think that such a pessimistic view is justified today for two reasons. First, as far as industry is concerned, the big cities have lost much of their attraction¹. Industry is today widely distributed in smaller areas, as we have seen happen in England – the new town of Harlow, for example, the industrial city of Slough, and similarly in almost all large countries. Secondly, modern town planning is aware of the perils which overcrowding brings in its wake and possesses the means to avoid them. Nevertheless, we should not blind ourselves to the danger that these things may – in spite of our greater knowledge – happen again. Cities grow with a magnetic force difficult to control. But since industrialization was, and always will be, the driving power behind urbanization, well planned industry itself can be a limiting factor, and the deterioration of environmental conditions with its harmful consequences to health may be halted at the beginning or even avoided altogether.

It would be indeed a great pleasure for me, if I could offer you Israel as an example where these considerations have been put into practice and proven their merits. Unfortunately, this is not the case. Urbanization in the modern sense was for a long time not the strongest feature in the development of the country; we have learnt our lesson through trial and error, glaring mistakes are only too apparent in the largest city, Tel-Aviv, but we feel sure that it is not too late to correct them. There are, however, some features in the industrial development of Israel which may be of value to our discussion on general principles. To present them in their proper context, I would like to outline briefly the historical development of industry in our country.

¹ *Bronowski J.*: Roy. Soc. Hlth. J., 82, 24 (1962).

We will pass over the first modest beginnings of industrialization in Israel, about forty years ago. At that time, the Jewish sector of the population was predominantly interested in agriculture. There was little health legislation concerned with industry, and government control was limited to the basic sanitary installations. A big step forward was taken during World War II when the industrial manpower of the country was mobilized, a labour inspectorate introduced, staffed with highly qualified inspectors from England, and the first labour ordinance published. However, in those hectic times not much consideration could be given to future development. No solid construction could be afforded, small workshops grew through makeshift additions into factories, overcrowding was the general rule, the accident rate extremely high. In spite of all this, it was an important period, for it changed the ideological aspect of Jewish colonization and established, so to speak, the rights of industrialization.

However, industrial development in Israel was to find its proper place as the principal stimulus for the growth of the country only after the phenomenon of mass immigration, the absorption of which would have been impossible without a major effort in industrialization. Agriculture, within the boundaries of the cultivable area of today, could not integrate vast number of immigrants. The opening of the arid zone of Israel for agriculture will be a very slow process and will not solve the present difficulties. That has left industrialization as the only feasible alternative. The country is now in the midst of a very dynamic industrialization process the outcome of which will have, as everywhere else, a serious influence on the health of the people. Nutrition, housing, general living conditions, recreation possibilities, all these basic requirements for public health are dependent on the economy, they have to be earned. For this reason the medical profession must take an interest in this development and, from its own point of view, watch and control those factors which may be detrimental to the health of the industrial workers, thus emerging the humanitarian approach with a professional service towards society.

“Watching” and “controlling” are weighty words, but the question is how should the job be done in new countries? And how have we accomplished it, with what degree of success or failure, in other words, what can be learnt from our experience?

Immigration into, or migration within, a country is inevitably accompanied by dangers to health and this danger increases automatically if people are concentrated in temporary housing units without proper sanitary installations. The situation may grow worse if the habits of the incoming population are not sufficiently understood and their ethnological background unintentionally neglected. This actually happened in Israel during the first very difficult period of integration of immigrants, a period of much improvisation, a distressing period which had to be gone through before the new, better planned

and more productive period was introduced. The medical services offered to this not too happy population of new arrivals were strained to the breaking point with complaints of a psychosomatic character easily related to the unsatisfactory conditions of life. But there were dangers to health of a more massive nature. Infant mortality, formerly down to a record low, rose to figures unknown for long years; our statistics of dysenteric diseases also showed a world record.

I mention these facts because the obvious unpreparedness from a medical and socio-medical point of view is a handicap towards developments of far-reaching effect. It may, in my opinion, be a still greater one in newly developing countries which do not possess several advantages that Israel had and which in retrospect may be termed her lifesavers in a most serious situation. One is the comprehensive sickness insurance, introduced by the workers' organization almost at the start of the colonization, i.e., many years ago, providing up-to-date medical care for every worker and his family. This insurance was extended also to every immigrant family. Other advantages were the unusually high number of well trained physicians, of the paramedical services and their comparatively satisfactory distribution throughout the country. Furthermore, mother and child care was on a high level as well as other welfare work, and last but not least, epidemiological services scientifically developed. All these organizations were initiated during the Mandatory period; they had become deeply rooted over the years and were understood and accepted by the population.

These were the basic conditions which made possible one of the most important medical activities during the whole course of the immigration period: the screening of a very high percentage of the immigration population for infectious diseases like TBC, trachoma, malaria, V.D., followed by treatment and, if necessary, hospitalization of the sick.

Having stated our advantages in the field of medical services, I feel on very uncertain ground in suggesting a screening procedure as a first step to be introduced for the industrial population groups of new developing countries. But this step seems so important that a start should be made, even if in the beginning only for the benefit of statistics and a more serious approach may have to wait until appropriate medical services for the industries, which we will turn to in a moment, can take over the job.

A very positive feature in the industrial development of Israel, which may interest newer countries, is the industrialization going on in rural areas. The movement started before mass immigration began in a certain type of cooperative agricultural settlement (known as the kibbutz). Originally tried out as a means of occupying older people and those no longer capable of hard labour in the fields, in the heat of the subtropical summer, this type of industrialization was such an economic success that the system made headway and is

now adopted more and more by rural communal settlements in the country. Their share in the industrial production amounts today to about 5%. The social structure of the settlement is in no way changed when the industry is introduced; it goes on operating both in agriculture and in industry. Not only small but quite large factories can be established in such rural centres.

The advantage which this form of industrialization has from the health aspect is obvious. There is no uprooting of communities, such as takes place upon migration into an industrial city, the community physician is better equipped to deal with his patient who has changed over from one occupation to another, health surveys can be carried out over longer periods since the turnover will be negligible.

This experience with rural industrialization was of immense help to the Israel Government in its attempt to provide work for new immigrants through the industrialization of small towns in rural areas, down to the fringes of the arid zone, an essential step at the time to stop the flow into the cities, which was regarded as dangerous from the social viewpoint as well as from that of health. Nothing final can be said about this decentralization effort apart from the fact that the undesirable trend towards migration into the larger cities, within easy reach from every direction, is being countered by bringing into these villages adequate medical and educational services, good housing, comfort and entertainment. Here too the example of the communal settlement, which maintained their cultural standards and therewith their high working morale through difficult times, served as an impressive lesson. Less successful, however, was our handling of the specific problems connected with industrial health as a whole. Nowhere was the lack of tradition more distinctly felt than here. The fascinating processes of building, of the installation of modern machinery, and of working with highly mechanized equipment, the search for an instruction of qualified workmen, absorb, in the first stage of modern industrialization, the attention of all concerned almost completely. Under such conditions it is quite understandable that industrial health legislation cannot be adequate and that the lack of trained personnel, especially of qualified industrial physicians, must hinder the efficient control of industrial hazards. The fact, furthermore, that industrialization generally begins with light industries, is a handicap for process, too, because the necessity for the building-up of a specific medical force is not immediately felt.

Israel has only recently entered the more dangerous phase of its industrial effort. Much has been done during this period to protect the working population: Legislation and technical supervision, on the one hand, have been continuously improved, while, on the other hand, a staff of industrial physicians, comprising today about 60 fully employed physicians engaged either by the Workers' Sick Fund Health Insurance or by industrial undertakings themselves, has been built up.

In spite of this obvious advance, we are, in my opinion, not yet properly equipped to cope with existing and anticipated problems of health in our industry. There are, *inter alia*, two phenomena which cause growing concern with respect to the health of the worker and to his productivity: a high accident rate, with human failures as always in the foreground, and a high rate of non-medical absenteeism from work. Where this phenomenon is not unusual in countries with high benefits of a sickness insurance, it is always a warning signal that something is wrong within the industrial structure, inside or outside the factory. And always both the physician and the worker suffer, the one because of the continuous pressure for sickleave, the other because of the demoralizing effect of malingering.

Sometimes, as in our case, an insurance system, well developed for the general population, is not sufficiently adapted to cover the special conditions of industrial life and needs supplementation through special services, covering the full range of activities in industrial medicine, safety and welfare, necessary for the prevention of occupation risks and – fortunately – also for the smooth functioning of production, in which the human factor continues to play an important role.

For developing countries still without the benefit of a general health insurance, industrialization poses an even greater challenge to the medical organization. Here medical activities concentrated on the industrial sector will be of much more general importance than in developed industrial states. Here may be the place for a first health survey of whole population groups, its results reflecting the general situation in the country. Here too, epidemiological studies and concentrated efforts for a health education campaign may find a natural starting point.

Since even the best ideas require means of realization, one question remains to be asked and upon the answer will depend the success of our endeavour. What should be the form of organization to allow for the implementation of a comprehensive industrial health plan?

A glance around the world will disclose great differences in the systems of health supervision. Each has its tradition, its legal and social background, none lays claim to perfection. Big factories with thousands of employees have the advantage of being self-supporting and they may – like Philips in Eindhoven – create an ideal combination of medical care, preventive and social work. Examples can also be found in less developed countries. The real problem starts with the medium-sized and the smallest industrial undertakings which will form, in spite of modern tendencies to the contrary, the major section of the industrial world of today. These factories and workshops cannot afford their own services but have to rely on outside help. Legislation, the backbone of government, will be of tremendous help for all activities where authority is required. But nowhere in the world is an inspectorate

available to supervise all the small workshops. Furthermore, the legal demands are not always an appropriate expression of our state of knowledge which cannot cope with the manifold aspects of a dynamic situation. The law is indispensable, but it is not enough.

This, therefore, seems to be the question for developing countries in the process of industrialization: How the health services for medium sized and small industries should be organized, in order to offer professional help both to the man on the job and the industry. In this respect, it makes no difference if a country is just getting under way or, like Israel, has a short history behind her and is now starting industrialization on a larger scale.

As we stand today, with no ready-made solution fitting all situations, it may perhaps be permitted to make a suggestion as to the direction in which a solution should be sought.

It is our idea that such industrial areas, in the countries we are concerned with, should be served by an Industrial Health Center. There exist several such centres within the industrial world. The most impressive, best adapted to local conditions and most experienced of these seems to me the one in the Netherlands, the only country, to the best of my knowledge, which has adopted this form of industrial health supervision for the whole country and now has 24 such centres¹. The establishment of our suggested Industrial Health Center should be an obligation on the part of the employers' organization – with the full sanction of the employees, as in the Netherlands – or a joint undertaking of both employers' and employees' organizations. This does not exclude governmental help on a subsidiary basis. Activities not strictly connected with industry itself, which could, however, be carried out in an Industrial Health Center – like general health surveys among population groups – would of course be a budgetary obligation of the government. Whereas methods of organization and special techniques could and should be studied and transferred, the range of activities of the Center in our region would have to be planned on a larger scale. Roughly, the work done in, and emanating from, the Center should be set under three headings: 1. *Prevention* of industrial illness and injuries. 2. *Medical Care*, including pre-employment health examinations, treatment of industrial diseases and of minor injuries, evaluation and re-evaluation of working capacity (after sickness or accidents or for reasons of age). 3. *Industrial Welfare*.

Headed by a physician trained in industrial health and with some gift for administration, the Center will have to function as a team with doctor, industrial nurse, sanitary and safety engineer, as well as a social worker, trained in psychology.

¹ *Lammers B.*: Interplant Occupational Health Services in the Netherlands. *Brit. Med. J.*, 2, 663 (1962).

The Center should not contain fewer divisions than those listed. Each of them represents the answer to a specific danger of occupational health. All pieces of the machinery are essential and bargaining for a more modest beginning would only harm the entire project. At a later stage, when industry has matured and industrial health established as a sine qua non of its structure, powers could be delegated, self-inspection of factories introduced under guidance and proper control. If we, however, do not start with the full weight of activities, but wait till something happens to force our hand, then it will again be a case of "too little and too late". In view of the tremendous economic difficulties in the way of general development, one may feel that such a plan is perhaps out of proportion. On the other hand, to be satisfied with less is, I am firmly convinced after many years in industrial welfare activities in a developing country, unrealistic.

One other activity of immense value, for which the Health Center should be springboard, is research work. The problems will present themselves in the daily routine, but their solution will require intensive field and laboratory studies, carried out in cooperation with an university department or a national research committee. Where scientific institutions are still not available, the necessary help will surely be forwarded by the respective bodies of a friendly nation. I am glad to say that we have just built such a department of scientific research in industrial medicine at the Medical School in Jerusalem. In this connection we would like to point out that research must not be limited to factory work. Agriculture is becoming rapidly mechanized. With, to mention only one example, its use of vast amounts of pesticides, the health worker is confronted with many problems which will fit into the framework of the scientific activity of the Regional Health Center of the future.

Our subject is of such magnitude, has so many facets that nothing but a modest attempt could be made to express views and suggestions based on limited experience. We must not forget that, in any development, a time factor is involved which will retard progress despite our best intentions. A really serious adaptation of people to the demands of a new environment takes time. Since this stands in contrast to the tempo of mechanization, discrepancies will arise and troubles start and it will require much understanding and much patience to put things in the right perspective. The physician's task in this sphere cannot be overemphasized.