

# A participatory and trans-sectoral health planning methodology in the context of a basic needs strategy for developing countries

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The medium-term target of health planning is to identify and implement those policies which make an optimum contribution under the given political, administrative and socio-structural constraints to the improvement of the physical, mental and social well-being of the population. The following reflections and results of an empirical research project outline an information system for health planning which will lead to the identification of such policies, which are not only based in the health sector. Furthermore, this information system enables an identification of those administrative, political and socio-economic restrictions which should be eradicated at the earliest in order to guarantee the physical, mental and social well-being of the population - a goal not only of health planning in the narrow sense - on a long-term basis. Even in this case, health planning is anything but a partial sector planning.

## 1. An Information System for Integrated Health Planning

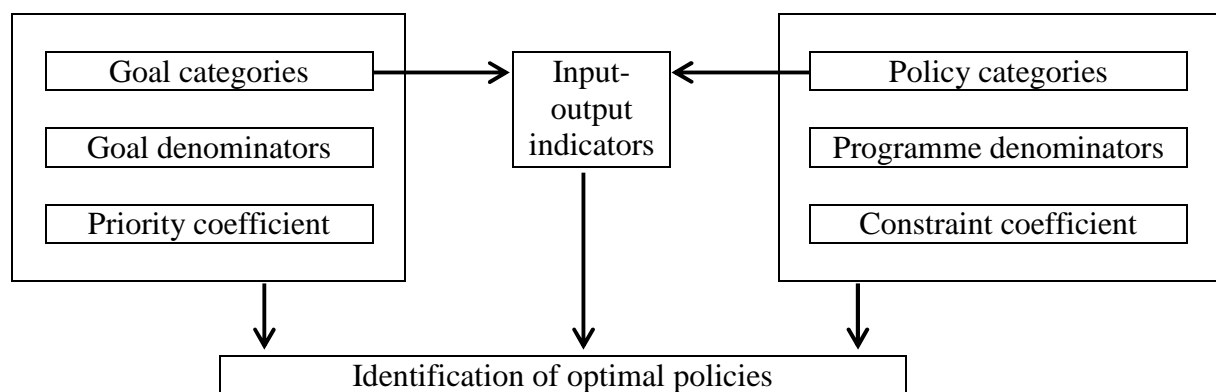
Health planning was for a long time considered to be health sector planning or sub-sector planning<sup>1</sup>. The former progressive planning approaches in the field of eradication of epidemics and manpower planning, and also recent system-analytical and network planning approaches are limited to the attempt to rationalize a sub-system in an environment of social irrationality<sup>2</sup>. The arbitrary limits of health planning are usually traditional administrative structures, expression and witness of privileges gained in social fights for power. Nowhere was this restriction observed more strongly than in Latin America<sup>3</sup>. The demand for an integration of health policies in the national development policy and the attempt to break the sectoral borders by means of planning approaches is one of the predominant subjects among progressive health planners in Latin America today, and not only there<sup>4</sup>.

If it is the object of health planning to contribute to the realization of social equality of physical, mental and social wellbeing<sup>5</sup>, and if it can be shown that this need not remain a verbal appeal only but something that can be transformed into a quantified planning approach, then this seems to indicate an alternative to the growth-oriented development policy of the countries of the impoverished world particularly in this field<sup>6</sup>.

Such an alternative, however, can only be outlined if health planning is not considered only as a traditional sector planning or sub-sector optimization but as an integral part of an integrated social planning, which steers towards the goal of social justice within the framework of national self-reliance<sup>7</sup>.

The concept of information system here denotes a coordination of the information essential for health planning in the above-mentioned sense<sup>8</sup>. An information system in this sense is a network of information which serves the object of identifying those policies which, under the given limitations, can improve the health status of the population at the earliest, or can identify those administrative, political and socio-structural limitations which must first be eradicated in order to guarantee physical, mental and social well-being for all members of society.

The information system suggested here consists of 7 different information segments: (1) goal categories, (2) goal denominators, (3) priority coefficient, (4) policy or programme categories, (5) programme denominators, (6) constraint coefficient, and (7) input-output indicators.



These seven information segments can be connected with one another in such a way that with the aid of a numerical optimization procedure, those policies can be identified, which provide a highest possible contribution towards goal achievement by means of the highest possible probability of execution, i.e. for example with minimum costs, by means of high political probability of execution, by means of financial feasibility for the population, etc.<sup>9</sup>

## 2. Physical, Mental and Social well-being as the Goal Function

If the goal of health planning is to improve the health of the people<sup>10</sup>, and if an international consensus also exists that health means not only the absence of disease or infirmity but a state of complete physical, mental and social well-being, then it appears to be senseless to convert internal efficiency indicators to the traditional health sectors to goal indicators<sup>11</sup>. On the contrary, this goal of health planning should be operationalized directly with the aid of indicators which are verifiable by data.

The following tendencies which are to be observed in operationalization can be seen in the literature on the development of health status indices<sup>12</sup>.

- 1) Most of the indices on health status are still formulated negatively, i.e. they refer only to damage to health<sup>13</sup>.
- 2) Indices which refer to highly aggregated mortality data are being questioned more and more, particularly when they are to be used not only for an analysis but also as the basis for planning<sup>14</sup>.
- 3) There is more and more emphasis on the necessity of health surveys, which can overcome the partiality of the health indicators generally used<sup>15</sup>.
- 4) There are approaches where, along with the actual health indicators, social indicators on nutrition, education, housing, etc. are also being considered<sup>16</sup>.
- 5) Indices are suggested, which refer to various stages of intensity of well-being, which therefore reject a mere nominal distinction between sickness and health as being too simple<sup>17</sup>.
- 6) All indices have some weighted denominators like incidence, vulnerability, duration, etc. which allow a comparability of health categories<sup>18</sup>.
- 7) The subjective health outlook of the people is being increasingly considered not only as the determinant of the need for health services<sup>19</sup>.

The first step towards operationalization of the goal of health planning is a categorization of physical, mental and social wellbeing. The World Health Organisation suggested internationally standardized categories for damages to physical and mental health, i.e. the International Classification of Diseases, and a mixed working group of the United Nations suggested categories for damages to social health<sup>20</sup>. If one takes the recommendations of both organizations as the basis of a categorization, then a very differentiated catalogue of health damages can be compiled. The damages to physical and mental health can be categorized according to this on very varied aggregation levels<sup>21</sup>.

The same is true analogically - even if less clearly - for damage to social health. The concrete planning constraints, particularly the resources available for planning and the aggregation level of available data determine the choice of the aggregation level.

When categorizing health for planning purposes, it is not a question of listing partial and mutually substitutable individual indicators<sup>22</sup>. The point of departure for an operational definition of health is a nominal definition, which considers health to be a catalogue of categories. The justification of the categorization chosen can only be examined on the basis of external criteria. Indices of validity can be: correlation with an external criterion and/or expert opinions (face validity)<sup>23</sup>.

The face validity in particular points to a second angle under which health is to be defined: to the definition of health from the viewpoint of the people<sup>24</sup>. In this case, the categories of well-being cannot be compiled only and categorically by health experts, but intermediary mechanisms which break through the possible one-sidedness and operational blindness of categorization by health experts should be institutionalized. Such mechanisms cannot be set in motion to identify goals, needs, motives, hopes and wishes of the planning objects by a method approach alone<sup>25</sup>, but above all by the participation of the people in goal identification and in programming<sup>26</sup>. Under the existing conditions of imbalance of knowledge and power, it is dubious whether, because of the lack of health education on the part of those affected by planning, the categories of physical health compiled by health experts can be validated by the people through this approach<sup>27</sup>. Particularly in the field of social health and even in the field of mental health, indications of the validity of the categories suggested by health experts should emerge on the basis of a participation of those affected by planning and a subsequent discussion with the planners.

In a case study in Valle del Cauca, Colombia, 23 categories of physical, mental and social health were used. The categories of physical and mental health, which are formulated negatively here, correspond to the International Classification of Diseases; they cover all the categories of diseases listed there and are compiled in 19 categories. In pragmatic terms, this method approach is necessary because otherwise any statistical information on the incidence and prevalence of these diseases can hardly be collected. The related categories of social health refer to the aspects of education, income, employment, and housing. The basis of health planning in this sense is the compilation of the list of nominal categories, which is shown in Table 1.

Table 1 - Nominal Categories of Health, Formulated Negatively	
1.	Tuberculosis
2.	Intestinal infectious diseases
3.	Diseases caused by hookworms and others
4.	Other infectious and parasitic diseases
5.	Nutritional deficiencies
6.	Neoplasms
7.	Diseases of the sense organs and hypertrophy of the tonsils
8.	Diseases of the circulatory system
9.	Diseases of the respiratory system
10.	Diseases of the digestive system
11.	Diseases of the genito-urinary system
12.	Complications during pregnancy, child birth and the puerperium
13.	Complications with abortive outcome
14.	Goitre and diabetes
15.	Dental diseases
16.	Congenital anomalies and diseases of earliest childhood
17.	Mental disorders
18.	Accidents, poisoning and effects of violence
19.	Other diseases
20.	Ignorance (people with less than 5 years of schooling)
21.	Poverty (people with an income below the minimum limit)
22.	Unemployment
23.	Unhygienic housing (without bathroom, toilet and latrine)

## 2.1 Comparability of goals

The nominal categories of health are per se not comparable<sup>28</sup>. They can become comparable only when common denominators can be found<sup>29</sup>. A common denominator can be the duration of the damage or the number of the individuals presently affected by such damage<sup>30</sup>. Only the identification of such common denominators - we refer to them in the following as goal denominators - can be an indication of the similarity or dissimilarity of certain aspects of goal categories and thus of priorities.

Indications of such goal denominators are to be found not only in the priorities of development plan documents, but also in some suggestions for the elaboration of health status indices. Examples for the priority dimensions in health plans are: damages which particularly affect working people<sup>31</sup>; damages which particularly affect the rural population<sup>32</sup>; damages

Table 2 – Goal Denominators and their Meaning

1. Morbidity	Health problems, which occur most frequently in the Department
2. Economic significance	a) health problems, which affect the active population b) health problems, which affect the working population
3. Social significance	Health problems of a) the under-privileged population groups b) the women c) the illiterate d) the poor e) the rural population f) the old people g) the children
4. Hospitalization	a) out-patient health problems, which make great use of health institutions b) in-patient health problems, which require a short stay in health care institutions (hospitals)
5. Reduction costs	Health problems, which could be solved by a minimum cash expenditure
6. Accessibility for preventive measures	Health problems, which can be influenced favourably by preventive measures
7. General accessibility	Health problems, which affect that part of the population which till now has not had sufficient medical attention
8. Transitivity	Health problems which are connected with infectious diseases
9. Duration of the disease	Health problems, which affect well-being over a long period
10. Diagnosability	Health problems, which because of the insufficient education of the people are not considered serious
11. Lethality	Health problems, which have a favourable ratio of fatal cases to sicknesses
12. Interdependence	Health problems, which with great probability occur together with other diseases
13. Vulnerability under existing conditions	Morbidity rate in 5 years without a change in the health sector
14. Vulnerability under optimal conditions	Morbidity rate in 5 years with optimal changes in the health sector

which particularly affect mothers and children<sup>33</sup>; damages which are communicable<sup>34</sup>; damages which are of an endemic nature<sup>35</sup>; etc. Vulnerability, incidence, importance or transcendence<sup>36</sup>, duration<sup>37</sup> and cost intensity<sup>38</sup> are other examples of goal denominators. From the health statistics available, almost any number of further denominators can be shown by means of indicators<sup>39</sup>. These denominators of the nominal categories of health consolidate one single aspect each time, with which the health status of the population is connected with its socio-economic context<sup>40</sup>.

If it is the goal of health planning to realize social equality with regard to physical, mental and social well-being, then the denominators which reflect social discrimination acquire strategic relevance: damages which particularly affect the rural population; damages which particularly affect minorities; damages which till now have affected the under-privileged classes, etc. An analysis of the determinants and consequences of social discrimination shows which denominators are relevant for health planning<sup>41</sup>. If it is the aim of health planning to give flank protection to economic development, then those denominators which refer to the working population or to the reduction costs of damages, etc. will acquire strategic relevance<sup>42</sup>.

Only after such denominators have been conceptualized, does the problem of collecting data and deciding on data quality arise. It would be beyond the scope of this study to discuss the problem in detail<sup>43</sup>. In principle, it is naturally important to take reliable and valid data as the basis of planning; the standard of the data quality, however, is, as a rule, determined by the availability of human, financial, temporal and statistical resources for planning. If epidemiological research is not possible because of time and budget constraints, then available statistics will have to be used; and if this is not possible in the planning region, one will have to operate with estimates by experts<sup>44</sup>; and if this is also not possible, then one has to revert to the statistics or research which may not refer to the planning region in question, but which could possibly give an approximate picture of the situation there. Even the combination of fragmentary data can be more important for planning than the traditional irrationality of intuitive decisions of individuals<sup>45</sup>.

In a case study, 22 denominators for the nominal categories of well-being were identified by means of hypotheses, literature studies, interviews with experts and available statistics. Table 2 shows the goal denominators and their meaning. The quantification of the goal denominators generally followed on the basis of available statistical material. For the denominators 'morbidity', 'vulnerability' and 'interdependence', estimated values were obtained by consulting experts because of the unavailability of statistical material. To determine vulnerability, the interviewed epidemiologist was given the morbidity data for all of Colombia, which at the time of the enquiry was incomplete - for List C of the International Classification of Diseases, only 35 of the most common diseases from a total of 70 were on

the list. Based on this data, the corresponding regional morbidity was estimated for the present period. With the aid of these estimates, a basis was established for estimating vulnerability under the existing conditions and for vulnerability under optimal conditions. At first, a prognosis was sought of regional morbidity within the next five years under the condition that unlimited resources would be available (optimal prognosis). This optimal prognosis was confronted with a minimal prognosis, a prognosis under the condition that within the next five years nothing would change in the health sector. The difference between the minimal prognosis and the optimal prognosis marks the possible sphere of influence of health policy. The denominator 'interdependence' was quantified through a similar procedure. Interdependence here means the probability of the joint occurrence of a damage with other damages, i.e. multimorbidity. In that, the score of 7 signifies a very high probability of interdependence, the score of 0 signifies a relatively low probability.

To quantify the vulnerability with regard to social damages, the following methods were chosen:

- 1) Education: The value of minimal prognosis for the entire population was estimated on the basis of census results on school education of the age group 9 to 17 years in 1964 and by using the additional information given by the school authorities who stated that the number of teachers' posts was not increased either in 1971 or in 1972, which in case of a high population growth would mean a lowering of the general standard of education. The optimal prognosis for the entire population was ascertained on the assumption that in the next five years the capacity of primary schools would be gradually expanded so that all school-age children would go to school.
- 2) Income: The value of the minimal prognosis was estimated on the basis of various sources, which predict a strong rise in unemployment for the planning region, indicating an increase in the number of families with very inadequate income. The optimal prognosis is based on the reflection that a certain reduction of the number of families with inadequate income can be achieved, but that five years is too short a period to drastically increase the income of so many families.
- 3) Employment: The estimation of the minimal prognosis is based on statements from various sources, which predict a spontaneous unemployment rate of 30 % for the planning region for 1980. Even with the use of all possible means, the optimal prognosis can at the most assume a fall in the rate to 8 %.
- 4) Housing: The figure from the housing census of 1964 was taken as the minimal prognosis; for the optimal prognosis, the deficit in minimum standard housing was halved.

Table 3 (rows A to V, Y and Z, columns 1 to 23) shows the results of the quantification of the goal denominators. For reasons of comparability the values were transformed to a scale defined between 0 and 1.



Table 3 – Entire Health Planning Information System with all Components

Health Planning in the Departamento del Valle del Cauca Information System										
Goal denominators										
Implementation Constraints										
Proposed Health Programmes										
Health Goals										
10.0	10.1	10.2	10.3	10.4	10.5	10.6	10.7	10.8	10.9	11.0
11.0	11.1	11.2	11.3	11.4	11.5	11.6	11.7	11.8	11.9	12.0
12.0	12.1	12.2	12.3	12.4	12.5	12.6	12.7	12.8	12.9	13.0
13.0	13.1	13.2	13.3	13.4	13.5	13.6	13.7	13.8	13.9	14.0
14.0	14.1	14.2	14.3	14.4	14.5	14.6	14.7	14.8	14.9	15.0
15.0	15.1	15.2	15.3	15.4	15.5	15.6	15.7	15.8	15.9	16.0
16.0	16.1	16.2	16.3	16.4	16.5	16.6	16.7	16.8	16.9	17.0
17.0	17.1	17.2	17.3	17.4	17.5	17.6	17.7	17.8	17.9	18.0
18.0	18.1	18.2	18.3	18.4	18.5	18.6	18.7	18.8	18.9	19.0
19.0	19.1	19.2	19.3	19.4	19.5	19.6	19.7	19.8	19.9	20.0
20.0	20.1	20.2	20.3	20.4	20.5	20.6	20.7	20.8	20.9	21.0
21.0	21.1	21.2	21.3	21.4	21.5	21.6	21.7	21.8	21.9	22.0
22.0	22.1	22.2	22.3	22.4	22.5	22.6	22.7	22.8	22.9	23.0
23.0	23.1	23.2	23.3	23.4	23.5	23.6	23.7	23.8	23.9	24.0
24.0	24.1	24.2	24.3	24.4	24.5	24.6	24.7	24.8	24.9	25.0
25.0	25.1	25.2	25.3	25.4	25.5	25.6	25.7	25.8	25.9	26.0
26.0	26.1	26.2	26.3	26.4	26.5	26.6	26.7	26.8	26.9	27.0
27.0	27.1	27.2	27.3	27.4	27.5	27.6	27.7	27.8	27.9	28.0
28.0	28.1	28.2	28.3	28.4	28.5	28.6	28.7	28.8	28.9	29.0
29.0	29.1	29.2	29.3	29.4	29.5	29.6	29.7	29.8	29.9	30.0
30.0	30.1	30.2	30.3	30.4	30.5	30.6	30.7	30.8	30.9	31.0
31.0	31.1	31.2	31.3	31.4	31.5	31.6	31.7	31.8	31.9	32.0
32.0	32.1	32.2	32.3	32.4	32.5	32.6	32.7	32.8	32.9	33.0
33.0	33.1	33.2	33.3	33.4	33.5	33.6	33.7	33.8	33.9	34.0
34.0	34.1	34.2	34.3	34.4	34.5	34.6	34.7	34.8	34.9	35.0
35.0	35.1	35.2	35.3	35.4	35.5	35.6	35.7	35.8	35.9	36.0
36.0	36.1	36.2	36.3	36.4	36.5	36.6	36.7	36.8	36.9	37.0
37.0	37.1	37.2	37.3	37.4	37.5	37.6	37.7	37.8	37.9	38.0
38.0	38.1	38.2	38.3	38.4	38.5	38.6	38.7	38.8	38.9	39.0
39.0	39.1	39.2	39.3	39.4	39.5	39.6	39.7	39.8	39.9	40.0
40.0	40.1	40.2	40.3	40.4	40.5	40.6	40.7	40.8	40.9	41.0
41.0	41.1	41.2	41.3	41.4	41.5	41.6	41.7	41.8	41.9	42.0
42.0	42.1	42.2	42.3	42.4	42.5	42.6	42.7	42.8	42.9	43.0
43.0	43.1	43.2	43.3	43.4	43.5	43.6	43.7	43.8	43.9	44.0
44.0	44.1	44.2	44.3	44.4	44.5	44.6	44.7	44.8	44.9	45.0
45.0	45.1	45.2	45.3	45.4	45.5	45.6	45.7	45.8	45.9	46.0
46.0	46.1	46.2	46.3	46.4	46.5	46.6	46.7	46.8	46.9	47.0
47.0	47.1	47.2	47.3	47.4	47.5	47.6	47.7	47.8	47.9	48.0
48.0	48.1	48.2	48.3	48.4	48.5	48.6	48.7	48.8	48.9	49.0
49.0	49.1	49.2	49.3	49.4	49.5	49.6	49.7	49.8	49.9	50.0
50.0	50.1	50.2	50.3	50.4	50.5	50.6	50.7	50.8	50.9	51.0
51.0	51.1	51.2	51.3	51.4	51.5	51.6	51.7	51.8	51.9	52.0
52.0	52.1	52.2	52.3	52.4	52.5	52.6	52.7	52.8	52.9	53.0
53.0	53.1	53.2	53.3	53.4	53.5	53.6	53.7	53.8	53.9	54.0
54.0	54.1	54.2	54.3	54.4	54.5	54.6	54.7	54.8	54.9	55.0
55.0	55.1	55.2	55.3	55.4	55.5	55.6	55.7	55.8	55.9	56.0
56.0	56.1	56.2	56.3	56.4	56.5	56.6	56.7	56.8	56.9	57.0
57.0	57.1	57.2	57.3	57.4	57.5	57.6	57.7	57.8	57.9	58.0
58.0	58.1	58.2	58.3	58.4	58.5	58.6	58.7	58.8	58.9	59.0
59.0	59.1	59.2	59.3	59.4	59.5	59.6	59.7	59.8	59.9	60.0
60.0	60.1	60.2	60.3	60.4	60.5	60.6	60.7	60.8	60.9	61.0
61.0	61.1	61.2	61.3	61.4	61.5	61.6	61.7	61.8	61.9	62.0
62.0	62.1	62.2	62.3	62.4	62.5	62.6	62.7	62.8	62.9	63.0
63.0	63.1	63.2	63.3	63.4	63.5	63.6	63.7	63.8	63.9	64.0
64.0	64.1	64.2	64.3	64.4	64.5	64.6	64.7	64.8	64.9	65.0
65.0	65.1	65.2	65.3	65.4	65.5	65.6	65.7	65.8	65.9	66.0
66.0	66.1	66.2	66.3	66.4	66.5	66.6	66.7	66.8	66.9	67.0
67.0	67.1	67.2	67.3	67.4	67.5	67.6	67.7	67.8	67.9	68.0
68.0	68.1	68.2	68.3	68.4	68.5	68.6	68.7	68.8	68.9	69.0
69.0	69.1	69.2	69.3	69.4	69.5	69.6	69.7	69.8	69.9	70.0
70.0	70.1	70.2	70.3	70.4	70.5	70.6	70.7	70.8	70.9	71.0
71.0	71.1	71.2	71.3	71.4	71.5	71.6	71.7	71.8	71.9	72.0
72.0	72.1	72.2	72.3	72.4	72.5	72.6	72.7	72.8	72.9	73.0
73.0	73.1	73.2	73.3	73.4	73.5	73.6	73.7	73.8	73.9	74.0
74.0	74.1	74.2	74.3	74.4	74.5	74.6	74.7	74.8	74.9	75.0
75.0	75.1	75.2	75.3	75.4	75.5	75.6	75.7	75.8	75.9	76.0
76.0	76.1	76.2	76.3	76.4	76.5	76.6	76.7	76.8	76.9	77.0
77.0	77.1	77.2	77.3	77.4	77.5	77.6	77.7	77.8	77.9	78.0
78.0	78.1	78.2	78.3	78.4	78.5	78.6	78.7	78.8	78.9	79.0
79.0	79.1	79.2	79.3	79.4	79.5	79.6	79.7	79.8	79.9	80.0
80.0	80.1	80.2	80.3	80.4	80.5	80.6	80.7	80.8	80.9	81.0
81.0	81.1	81.2	81.3	81.4	81.5	81.6	81.7	81.8	81.9	82.0
82.0	82.1	82.2	82.3	82.4	82.5	82.6	82.7	82.8	82.9	83.0
83.0	83.1	83.2	83.3	83.4	83.5	83.6	83.7	83.8	83.9	84.0
84.0	84.1	84.2	84.3	84.4	84.5	84.6	84.7	84.8	84.9	85.0
85.0	85.1	85.2	85.3	85.4	85.5	85.6	85.7	85.8	85.9	86.0
86.0	86.1	86.2	86.3	86.4	86.5	86.6	86.7	86.8	86.9	87.0
87.0	87.1	87.2	87.3	87.4	87.5	87.6	87.7	87.8	87.9	88.0
88.0	88.1	88.2	88.3	88.4	88.5	88.6	88.7	88.8	88.9	89.0
89.0	89.1	89.2	89.3	89.4	89.5	89.6	89.7	89.8	89.9	90.0
90.0	90.1	90.2	90.3	90.4	90.5	90.6	90.7	90.8	90.9	91.0
91.0	91.1	91.2	91.3	91.4	91.5	91.6	91.7	91.8	91.9	92.0
92.0	92.1	92.2	92.3	92.4	92.5	92.6	92.7	92.8	92.9	93.0
93.0	93.1	93.2	93.3	93.4	93.5	93.6	93.7	93.8	93.9	94.0
94.0	94.1	94.2	94.3	94.4	94.5	94.6	94.7	94.8	94.9	95.0
95.0	95.1	95.2	95.3	95.4	95.5	95.6	95.7	95.8	95.9	96.0
96.0	96.1	96.2	96.3	96.4	96.5	96.6	96.7	96.8	96.9	97.0
97.0	97.1	97.2	97.3	97.4	97.5	97.6	97.7	97.8	97.9	98.0
98.0	98.1	98.2	98.3	98.4	98.5	98.6	98.7	98.8	98.9	99.0
99.0	99.1	99.2	99.3	99.4	99.5	99.6	99.7	99.8	99.9	100.0





Table 3 – Health Planning Information System

Goal / Denominator Matrix (Excerpt)

			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
47.6	Economic significance	active population	A	0.11	0.30	0.19	0.01	0.12	0.00	0.05	0.12	0.34	0.33	0.71	1.00	0.32	0.04	0.30	0.01	0.14	0.23	0.35	
77.6		working population	B	0.02	0.15	0.09	0.10	0.04	0.01	0.08	0.07	0.50	0.15	0.15	0.03	0.00	0.00	0.00	0.02	0.06	0.41	1.00	
34.3	Social significance	under-privileged	C	0.17	0.52	0.39	0.05	0.28	0.07	0.13	0.13	0.39	0.30	0.48	0.47	0.12	0.09	0.42	0.05	0.13	0.20	0.66	
26.6		women	D	0.02	0.10	0.02	0.02	0.02	0.06	0.06	0.04	0.06	0.10	0.12	1.00	0.21	0.02	0.00	0.00	0.04	0.06	0.12	
1.3		illiterate	E																				
27.0		all poor people	F																				
65.3		rural population	G	0.26	0.89	0.73	0.04	0.48	0.00	0.14	0.23	1.00	0.41	0.63	0.87	0.26	0.07	0.53	0.02	0.12	0.27	0.53	
1.6		old people	H	0.23	0.27	0.25	0.08	0.34	0.21	0.20	0.95	0.53	0.58	0.84	0.00	0.00	0.20	0.89	0.13	0.31	0.26	1.00	
111.6		children	I	0.18	0.80	0.57	0.06	0.29	0.01	0.13	0.01	0.88	0.11	0.12	0.00	0.00	0.06	0.27	0.04	0.05	0.20	1.00	
48.6		Hospitalization	out-patient	K	0.08	0.24	0.12	0.30	0.10	0.04	0.14	0.12	0.62	0.20	0.29	0.03	0.00	0.02	0.00	0.03	0.10	0.42	1.00
28.3			in-patient	L	0.18	0.73	0.03	0.23	0.23	0.30	0.23	0.40	0.48	0.88	0.73	0.61	0.89	0.04	0.00	0.25	0.27	0.84	1.00
47.3	Reduction costs		M	0.51	0.75	0.90	0.85	0.44	0.10	0.80	0.54	0.03	0.41	0.72	0.21	0.36	0.56	1.00	0.23	0.00	0.49	0.79	
81.3	Accessibility for preventive measures		N	1.00	0.68	0.93	0.70	0.96	0.17	0.06	0.00	0.21	0.67	0.56	0.87	0.73	0.83	0.91	0.73	0.40	0.40	0.18	
66.3	General accessibility		O	0.18	1.00	0.74	0.06	0.28	0.00	0.11	0.10	0.97	0.19	0.22	0.91	0.32	0.07	0.30	0.04	0.09	0.18	0.28	
86.3	Transitivity		P	0.50	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
71.0	Duration of illness		Q	0.72	0.72	0.72	0.72	0.61	0.91	0.78	0.82	0.53	0.71	0.56	0.38	0.30	1.00	0.00	0.88	0.67	0.51	0.59	
25.3	Diagnosability		R	0.00	0.85	0.88	0.90	0.97	0.84	1.00	0.97	0.96	0.85	0.94	0.97	1.00	0.42	1.00	0.72	0.81	1.00	0.88	
22.6	Lethality		S	0.86	0.58	1.00	0.67	0.93	0.00	1.00	0.71	0.89	0.93	0.95	0.93	0.91	0.95	1.00	0.45	0.91	0.52	0.91	
53.3	Interdependence		T	0.75	1.00	1.00	1.00	1.00	0.50	0.75	1.00	0.75	0.75	0.50	0.75	0.75	0.25	1.00	0.25	0.25	0.00	0.50	
140.0	Mortality		U	0.18	0.95	0.05	0.17	0.27	0.36	0.00	1.00	0.65	0.18	0.13	0.02	0.01	0.04	0.00	0.43	0.02	0.37	0.49	
56.2	Morbidity		V	0.15	0.26	1.00	0.05	0.49	0.03	0.46	0.40	0.71	0.32	0.26	0.03	0.00	0.13	0.59	0.08	0.01	0.08	0.69	
↑ Weighting Factors	Priority coefficient		W	0.31	1.00	0.61	0.39	0.41	0.04	0.16	0.39	0.74	0.35	0.37	0.43	0.15	0.12	0.33	0.14	0.00	0.25	0.78	
	Morbidity (per 1,000)		X	56	90	336	21	166	14	158	140	240	110	92	14	5	47	200	31	9	30	234	847
	Vulnerability	minimal prognosis (per 1,000)	Y	60	120	440	30	180	16	165	140	260	110	95	18	10	50	220	32	13	45	234	880
		maximum prognosis (per 1,000)	Z	10	40	80	9	35	12	150	140	200	50	50	4	2	15	50	29	6	20	200	750
Denominators	Goals		Tuberculosis	1	2.0	3.0	2.0	2.4	2.4	2.4	1.6	1.4	1.6	1.2	2	3.6	1.6	1.8					
Denominators			Intestinal infectious diseases	2	4.0	4.0	3.8	3.6	3.2	3	2.2	2	2	1.6	2.4	2.4	4	2.6	2.2				
Denominators	Goals		Diseases caused by hookworms and others	3	2.0	2.4	2.4	2.4	2.4	1.6	1.4	1.6	1.2	2	3.6	1.6	1.8						
Denominators			Other infectious and parasitic diseases	4	2.4	2.4	2.4	2.4	2.4	1.6	1.4	1.6	1.2	2	3.6	1.6	1.8						
Denominators	Goals		Nutritional deficiencies	5	2.4	2.4	2.4	2.4	1.6	1.4	1.6	1.2	2	3.6	1.6	1.8							
Denominators			Neoplasms	6	2.4	2.4	2.4	2.4	1.6	1.4	1.6	1.2	2	3.6	1.6	1.8							
Denominators	Goals		Diseases of the sense organs and hypertrophy of the tonsils	7	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	
Denominators			Diseases of the circulatory system	8	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Denominators	Goals		Diseases of the respiratory system	9	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	
Denominators			Diseases of the digestive system	10	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Denominators	Goals		Diseases of the genito-urinary system	11	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	
Denominators			Complications during pregnancy, child birth and the puerperium	12	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Denominators	Goals		Complications with abortive outcome	13	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	
Denominators			Goitre and diabetes	14	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Denominators	Goals		Dental diseases	15	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	
Denominators			Congenital anomalies and diseases of earliest childhood	16	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Denominators	Goals		Mental disorders	17																			
Denominators			Accidents, poisoning and effects of violence	18																			
Denominators	Goals		Other diseases	19																			
Denominators			Ignorance (people with less than 5 years of schooling)	20																			
	a) double		1	2.0	3.0	2.0	2.4	2.4	2.4	1.6	1.4	1.6	1.2	2	3.6	1.6	1.8						
	b) fourfold		1	4.0	4.0	3.8	3.6	3.2	3	2.2	2	2	1.6	2.4	2.4	4	2.6	2.2					







The weighting of goal denominators reflects the political weighting of the various strategical components of the goal definition. The denominators are thus compared to one another and ranked according to their importance. The individual denominators were firstly ranked according to their relative weight in a range of 1 to 9 and secondly according to a scale from 0 to 7. This method avoids a too-narrow variation width in ranking and guarantees varied margins between the assessments. The most important denominator which ranks at first place was marked by factor 19, the next in importance with 18, etc. These values were multiplied thereafter with the corresponding value which they were given in the scale (0 to 7) whereby the original ranking was corrected. Five doctors who also had political administrative functions were called in as experts; the results can be seen in Table 3 (left values, rows A to V).

The results show that the general concept of "social importance with regard to the underprivileged" was given relatively little weight (34.3), whereas the sub-concepts of "social importance with regard to the rural population or children, respectively" were given high (65.3) or the highest importance (111.6). The lowest scores were given to the dimensions "social importance with regard to the old people" (1.6) or "with regard to the illiterate" (1.3). These extremely wide-ranging values indicate that it was right to subdivide the concept of "social importance" into several categories. It is interesting to see that the dimensions "economic significance" as well as "reduction costs" were assessed relatively low (47.6 and 47.3).

## 2.2 Priorities

Priorities only result in a rational way when the related goal denominators are weighted or compared according to their functional relationship. In most of the suggested health status indices, this occurs in the form that the applied denominators are either weighted equally or weighted with certain external factors<sup>46</sup>. Here the criterion for such a comparison is called the denominator of goal denominators. Such weightings are undertaken in every health policy. One of the aims of an information system is to make such decisions visible and open to criticism<sup>47</sup>. From the interrelations between goal categories, goal denominators and denominator for goal denominators, it is possible to derive a priority list of health damages which - under consideration of the socio-economic context of health - should be reduced more than others by policies, if the goal is the improvement of the health of the population<sup>48</sup>. A priority coefficient which reflects the political priority of the individual disease categories was formed from the combination of quantification and weighting of the goal denominators.

Formally, it is the weighted arithmetic mean of the values of the goal denominators and was transformed to a scale between 0 and 1. Table 3 shows its values in row W. This shows that, according to the criteria chosen, intestinal infectious diseases are to be given the highest priority and mental disorders the lowest. The five most important groups of diseases are: intestinal infectious diseases, diseases of the respiratory system, diseases due to hookworms and other worms, complications during pregnancy, childbirth and puerperium, nutritional deficiencies. Less important are: mental disorders, neoplasms, and diseases of the sense organs.

### **3. Selection and Weighting of (Health) Policies**

While some approaches towards the use of such a priority coefficient are to be found in some health planning methods, there is little discussion on the search for policies (understood here as a global concept, covering programmes, instruments, actions, activities, measures, etc.) - as they have been proposed here. In this context, almost all the methods of health planning are only oriented to the resources traditionally used in the health sector<sup>49</sup>. There is also little effort to find out which policies could improve the health of the population, at best it is asked to what degree specific resource combinations in the traditional health sector can influence a change in the health status of the population<sup>50</sup>.

At least four different method approaches may be analytically differentiated:

- 1) A cause analysis which isolates those factors ex post which have brought about a change in the health status. Such a cause analysis necessarily extends beyond sector limits<sup>51</sup>.
- 2) An inventory of available resources and executed actions in the health sector, whereby the decisive question is how far unconventional resources are taken into consideration or not<sup>52</sup>.
- 3) An inventory of all policies which could influence the improvement of the health status of the population in the planning region; this, however, is a step which requires social imagination<sup>53</sup>.
- 4) An inventory of all policies which have been executed in planning regions with similar starting levels for improvement of the health status of the population<sup>54</sup>.

All these method approaches must be used for effective planning. There are no rough and ready rules for this. "The preparation of health programmes is no mechanical job: it is more an art than a science"<sup>55</sup>.

In our case study in Colombia, for example, the third method was selected. With the aid of an open questionnaire which covered the three components of the basic definition of health, i.e. physical, mental and social well-being, not only doctors and paramedical personnel were interviewed but also housewives, teachers, technicians and land labourers. This survey resulted in 155 more or less heterogeneous programme proposals which were in no way restricted to the narrow health sector. The sector-external programmes were related to a raise in the standard of living of the under-privileged rural and urban population, in particular to the improvement of the health status, the level of education and to the increase and stability of income. For pragmatic reasons, it was not possible to operate with such a long list of programme proposals. Therefore, in a new interview of persons of different professional and social origin, the list of programmes was reduced on the basis of the anticipated influence of these programmes on an improvement of physical, mental and social well-being. The result was a list of 47 programmes which is presented in Table 3, rows 1 to 47.

### 3.1 Constraints

Through an identification of anticipated constraints, the policies were characterized and made mutually comparable<sup>56</sup>. Constraints or programme denominators are those strategic elements or aspects which hinder the implementation of policies under the given socio-economic conditions in the planning region.

The socio-economic analysis of the power structure and the network of vested interests as well as an analysis of the scarcities in the survey region are required before a search for the constraints for implementation of policies can set in<sup>57</sup>. Experience with policies acquired in other comparable planning regions can also indicate constraints<sup>58</sup>. Almost all publications on planning and evaluation point to general constraints for individual types of policies: implementation costs, ratio of operating costs to investment costs, acceptance by the population, class interests, etc.<sup>59</sup>

By identifying such constraints, the policies are characterized and made mutually comparable. In this sense, a policy is nothing more than a function of financial, economic, technical, social, political, administrative and other constraints. In a cost/effectiveness analysis the costs are explicitly taken as the essential strategic aspect of policies<sup>60</sup>, whereas the criticism of this approach points to the other constraints which usually impede the execution of policies, such as political feasibility, compatibility with existing power structures and administrative traditions, etc.<sup>61</sup> Here too, this process of search for the strategically relevant constraints is a process of analytical imagination.



Table 4 – Programme Denominators (Constraints) and their Operationalization

1. Financial capacity of the population	Do you think that the programme corresponds to the economic capacity of the people?
2. Short term availability of the necessary human and material resources	Do you think that the human and material resources necessary for the execution of the programme are available at short notice?
3. Administrative feasibility	Do you think that the institutional possibilities suffice for the execution of the programme?
4. Political feasibility	Do you think that the political decision-makers approve of this programme?
5. Duration of the programme until the first results appear	Do you think that the programme will be effective soon?
6. Understanding and willingness of the people to cooperate	Do you think that this programme will be accepted by the people?
7. Continuity of implementation	Do you think that the continuity of programme implementation by the administration is assured?
8. Costs	What costs are incurred through execution of the programme? (detailed analysis)
9. Group interests of the doctors	Do you think that the programme is directed against the interests of the doctors?
10. Interdependence of programmes	Do you think that the success of the programme depends on the execution of other programmes?
11. Dependence on several budget items	Do you think that the programme obtains its funds from different budget items?
12. Dependence on foreign exchange	Do you think that the programme requires a large amount of foreign exchange? (detailed analysis)
13. Coverage of the population	Do you think that a large part of the population will be covered by this programme?
14. Ratio of running costs to investment costs	Do you think that this programme affects the running costs more or the investment costs?

In our case study, a total of 14 constraint categories were determined on the basis of hypotheses and interviews with experts; these constraints are typical, regularly recurring barriers against the execution of projects, programmes and policies. Table 4 shows the constraints or programme denominators which have been taken into account; at the same time, it points to the operationalization of the question. As no statistics on these aspects were available, interviews with experts had to be used.

The quantification of the specific scores of individual constraints were submitted for evaluation to experts who seemed to be particularly qualified to answer these detailed questions because of their political and administrative functions. For this questionnaire, too, the 8-point scale was used. The arithmetic mean of the scores of the individual answers was taken and transposed to a scale from 0 to 1 so that these answers would be more suitable for calculations. Table 3, rows (a) to (p), shows the individual scores of the constraints for each programme.

A constraint coefficient can be constructed in the same way as a priority coefficient. For this, it is first necessary to identify a common denominator for the constraints, such as the degree to which the individual constraint influences the implementation probability of policies in the planning region, i.e. a weighting of each constraint against the other as a result of their (assumed) functional interrelationship<sup>62</sup>.

In our case study, these constraints were weighted on the basis of an interview of experts; here, sociological scaling methods were mostly used. From the combination of this weighting of the constraints and the respective scores of the individual constraints for the individual programmes, a constraint coefficient which indicates the relative difficulty of the implementation of individual programmes was derived. Programmes which cost less, are little dependent on foreign exchange, have a relatively wide coverage of the population, and can show quick results, are easier to implement than programmes which require foreign exchange, conflict with the group interests of doctors and require human and material resources which still have to be created. All these arguments are reflected in the constructed constraint coefficient for the programmes listed above; Table 3 shows these values in row 9.

### **3.2 Input-Output-Relations**

The objection raised against the use of optimization techniques in health planning was sometimes that it is unrealistic to assume that the effects of one programme or one measure on a change in the health status could be identified<sup>63</sup>. This does indeed seem to be a grave

statement. It would imply that a doctor could, in the case of gastritis, equally prescribe a head bandage, a leg operation or pills; but, organized health measures are not at all conceivable without well-founded hypotheses about the probable relationship between a health measure and the change in the health of a patient. Such - stochastic, not deterministic - relations between measures and objectives, between input and output, can be identified<sup>65</sup>, not only at the level of direct experience which characterizes the daily practice of medical personnel, but also at a very abstract level of analysis<sup>64</sup> which characterizes the terrain of social scientists.

Even though these relations between measures and objectives can usually be proved by an ex post evaluation, this is not a conclusive objection against ex ante hypotheses; in both cases the crucial methodological problem is the attribution to individual factors<sup>66</sup>. At a medium level of experience, which is most closely associated with the area of health planning, there are indeed epidemiological/sociological studies which deal with such input-output relations, for instance, the influence of different types of medical care on the reduction of infant mortality<sup>67</sup>. In all evaluation studies on health programmes and in all sector analyses the conclusions are based on such surveys<sup>68</sup>.

Input-output relations can be most precisely determined with the aid of detailed epidemiological/sociological studies; but the transferability of the findings to another historical/social context is often questionable<sup>69</sup>. Given the large number of input-output relations which must be considered in health planning and the paucity of resources for research, there is little probability that a large number of such studies can be undertaken immediately<sup>70</sup>. The results of ex post evaluation of policies can and must be increasingly fed into the information system<sup>71</sup>. If necessary, estimates by experts must be used<sup>72</sup>. But here it is necessary to obtain the technical knowledge of experts on the relation between policies and goal achievement, but not their ideological views which may be coloured by professional interests<sup>73</sup>. Furthermore, attention should be paid to the representativity of different socio-economic environments; input-output relations which are valid for urban centres are possibly not valid for rural areas<sup>74</sup>.

In our case study, such input-output relations were determined by interviews of experts. For instance, a tuberculosis specialist was asked to state whether and how far each one of the mentioned programmes could reduce the incidence of tuberculosis within a particular plan period - 5 years. The other categories of physical, mental and social well-being were dealt with similarly. The varied importance of various programmes for the reduction of individual diseases or the improvement of health status were operationalized by a 7-point scale; the value of 7 indicated a high importance for the improvement of health. Table 3, rows 1 to 23, columns 1 to 47, shows some important input-output relations.

Table 3 presents the whole information system for health planning, as it was determined in our case study in Valle de Cauca, Colombia.

### 3.3 Optimization

The information collected with the aid of such an information system can be meaningfully combined and coordinated in order to obtain political recommendations with the help of a constraint/effectiveness analysis or with the help of an optimization method<sup>75</sup>. If one combines the input-output scores or utility values, priority coefficients and constraint coefficients, and compares this information package with the aggregated information on those constraints which do not seem to be variable at present, then an indication is obtained of those policies which can - under the given constraints - develop their utility most strongly, i.e. which can contribute optimally to an improvement of the goal function.

A numerical optimization technique was used in the case study as it held prospects of finding the optimum of a goal function consisting of assessed sub-goals, whereby a number of constraints were taken into consideration. Linear programming could not be used because of the non-linearity of a number of input-output scores of several programmes; the so-called evolution strategy was used.

The utility of an individual programme is calculated as follows. The input-output score, which can vary between 0 and 7, is transformed to a scale between the minimal prognosis and the optimal prognosis of morbidity in 5 years. The utility scores of all goal categories are summed up and multiplied by the corresponding constraint coefficient. In case the total cost is not recommended in the optimization, but only a reduced cost level, the utility score is changed in proportion to the relation between cost and effectiveness. For programme 22, for example, the utility score is computed as follows:

$$X = ((120-40)/7 \times 6.4) + ((440-80)/7 \times 5) + ((30-9)/7 \times 6.4) + ((180-35)/7 \times 3.6) + ((110-50)/7 \times 6) + ((45-20)/7 \times 5.2) \times 0.77$$

This total utility value of  $X = 380$  is related to the total cost of 19 million pesos. If only 7.5 million pesos are to be proposed, then the utility score is reduced to 149. Different types of functions can be formed depending on how many such utility scores are available per programme. If one has only two scores (including the score 0), a linear function can be

formed; in case of three values, a quadratic function, etc.; depending on the importance one gives to a programme, one can determine one or more scores. The degree of accuracy and probability of the function increases with the number of scores.

By feeding all these values in the final optimal combination of the health programmes can be determined.

### **3.4 Results**

Table 5 shows some of the results of optimization. These results present allocation recommendations under alternative assumptions that 10, 20, 30, 40, 50 or 100 million pesos will be available. It is particularly interesting that even programmes outside the health sector are recommended for execution, i.e. some of the programmes outside the health sector have a higher utility than many of the programmes in the health sector. These results indicate that the health planning methodology applied in this case study actually goes beyond sector boundaries and does not only suboptimize within the narrow boundaries of the health sector.

It may be emphasized here that this case study has a highly approximative method approach as the results are based to a great extent on estimates of experts which are not representative and, as such estimates of experts usually do, reflect personal and professional interests. All such objections to the quality of data are justified. However, the aim of the case study was to show the interrelationship between different information elements and to derive the justification of such an information system from the results; the case study was only intended to be a model for a health planning methodology or a methodology leading to a "rational service budget".

A realistic health planning will have to operate with much more rigid data - in all respects. But the model presented here can show what information must be collected and how it can be combined. This was the sole aim of the case study.



#### **4. Health Planning as Trans-sectoral Planning**

This brief outline of the information system for health planning presented here not only makes it possible to break through the traditional sector boundaries and to give sector-internal decision aids at the same time, but it also implies a step in the direction of democratization of health planning. Not only is access obtained to the knowledge and experience of those affected by planning - who hitherto were not involved in the planning process - within the framework of a structured planning dialogue, but at the same time coordination of isolated technical knowledge is rendered possible.

Health planning becomes strategically relevant for development only when it - at first experimentally - questions the political and socio-economic constraints of health policy itself. The identification of constraints within the proposed information system for health planning permits the identification of those constraints which most impede a technically reasonable policy. Based on this information, a priority list could be prepared which makes the eradication of these constraints the starting point of planning. Thus, if health planning is to be strategically relevant to development, then the eradication of constraints must be transformed to a goal function which sets the whole planning process in motion again<sup>77</sup>. It may then possibly be seen that it is very important for health planning to break the influence of budgetary allocation barriers on health policy decisions or to reduce the constraint of dependence on foreign exchange.

From the goal of improved physical, mental and social well-being of the population, strategic elements could emerge which would point to necessary and "practicable" political and socio-structural measures which - supported by a democratic dialogue - could provide the basis for a policy dedicated to social development goals. Such a policy is by no means restricted to activities within the so-called 'social sectors'.

**Notes**

This chapter represents an abbreviated and revised version of Schwefel et al. (1972).

1. cf. Feldstein (1970), Ahumada (1965), Popov (1965), WHO (1969-2), p. 15
2. See Abernathy (1972), Arnold (1968), Elveback (1965), Merten (1966), Newheiser (1972) and Zemach (1970)
3. cf. A. Horwitz (1962), Cabello (1962), Cibotti (1969), Duran (1970), Novais (1964), Sonis (1964), Zschock (1970)
4. cf. especially Servicio Seccional de Salud de Antioquia ("Plansan") (1971), Programa de Investigación en Planeación Integral de Salud ("Colinplas") (1972)
5. WHO-Constitution (1967); cf. Fendall (1963); Sonis (1964), p. 271 f.
6. cf. Pan American Health Planning Centre (1972), p. 20 ff.
7. cf. Servicio Nacional de Salud (1963), p. 34 ff., WHO (1954), p. 44, WHO (1970-2), p. 10 ff., WHO (1971), p. 47 ff. and also Schwefel (1972-1), p. 5 ff.
8. cf. Michael (1968) and Navarro (1969)
9. This is only one example.
10. cf. WHO (1954), p. 46, WHO (1970-2), p. 8, Popov (1971), p. 7
11. e.g. Popov (1971)
12. cf. especially Fanshel (1970), Lindner (1966) and Malenbaum (1971)
13. cf. Correa (1967), p. 910, Fuchs (1968), p. 115 ff.; Navarro (1969), p. 184 ff., et al.
14. cf. Agualimpia (1968), p. 61 ff., and Navarro (1969), p. 184 f.
15. cf. e.g. Rudermann (1966), p. 196 ff., and Badgley (1968), pass.
16. cf. United Nations Research Institute for Social Development (1970)
17. cf. Fanshel (1970), p. 1028 ff.
18. cf. Ahumada (1969), p. 24 ff., U.S. Department for Health, Education and Welfare (1969), p. 25 ff., and Packer (1968), p. 239 ff.
19. cf. e.g. Engler (1970), p. 11 ff., Navarro (1969), p. 185 and Rohde (1970), p. 12 ff.
20. See WHO (1968-2) and United Nations (1970)
21. Basic tabulation lists of ICD, WHO. For mental well-being see J. Horwitz (1967)
22. cf. Nowak (1963)
23. Adams (1966)
24. Hughes (1966), p. 147 ff.
25. Surveys, content analysis, projective techniques, analysis of family expenditure, etc.
26. cf. Hassouna (1970), p. 29 f., WHO (1954), p. 35 ff.
27. cf. Hassouna (1970), Colt (1970), Galiher (1971) and Kerr (1969)
28. See Galtung (1966), p. 78 ff.
29. cf. Ahumada (1965), p. 3 fL
30. ibidem



31. cf. WHO (1967), p. 7
32. cf. Economic Commission for Asia and the Far East (1964), p. 23
33. cf. WHO (1967), p. 7
34. cf. WHO (1954), p. 40
35. cf. Economic Commission for Asia and the Far East (1964), p. 23
36. Ahumada (1965), Bressoni (1972), Pan American Health Organization (1965; 1967)
37. cf. US Department for Health, Education and Welfare (1969), p. 25 ff. and Packer (1968), p. 239 ff.
38. cf. Navarro (1969), p. 183
39. Based on available statistics
40. Even "incidence" implies a value judgement.
41. E.g. Ministerio de Salud Pública (Evidencia - 1969) and Runciman (1966)
42. cf. Baker (1971), Bloomfield (1966), Dorolle (1953), Klein (1971), Mushkin (1962), McKenzie-Pollock (1966), Myrdal (1952), Plaschka (1969), Weisbrod (1961), Wolf (1967)
43. cf. WHO (1968) and WHO (1969-2)
44. cf. Feldstein (1970), p. 140, Kane (1972), p. 283, Packer (1968), p. 245, Popov (1971), p. 18, 22 and 45, and especially Stimson (1969) pass.
45. Birauld (1964), p. 118
46. cf. Fanshel (1970) and Navarro (1969)
47. cf. Dreze (1962)
48. cf. Ahumada (1965), Bressoni (1972)
49. cf. Ahumada (1965), p. 29 ff.
50. cf. e.g. Malenbaum (1970)
51. Aizenberg (1968), Sonis (1964), Schwefel et al. (1972), p. 66 ff. and Valdés (1971)
52. This should be seen in the context of alternative technologies.
53. See note 25
54. See e.g. the barefoot doctors; cf. Peking-Rundschau (1972)
55. WHO (1954), p. 35
56. i.e. denominators of policies
57. cf. e.g. Bryant (1971), Allende (1939), Fanon (1969), Tjulpanow (1972), Litsios (1971), p. 161 ff.
58. cf. e.g. Taylor (1968)
59. cf. Colbourne (1963), p. 37 ff., Evans (1970), p. 303, WHO (1954), p. 25, WHO (1969-1), p. 1 2
60. See Denison (1969), Packer (1968), W. Smith (1968)
61. cf. Servicio Seccional de Salud de Antioquia (1971) and V. Taylor (1969)
62. By factorial analysis for example.
63. cf. Navarro (1969), p. 185 and White (1968)

64. See Schach (1972)
65. cf. e.g. Malenbaum (1970)
66. See especially Popper (1965), p. 40 ff.
67. cf. the literature mentioned by Behm (1962)
68. cf. Deniston (1969) and Drobny (1964)
69. Note that there are different etiologies for tuberculosis in different continents for example.
70. This could be connected with foreign aid.
71. See especially Litsios (1971)
72. See Gehmacher (1970) and Stimson (1969)
73. cf. Segal (1968)
74. Representativity of situations and of experts should be distinguished.
75. cf. Rechenberg (1970) and H.-P. Schwefel (1975)

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