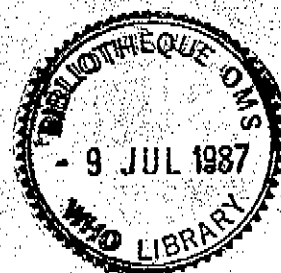




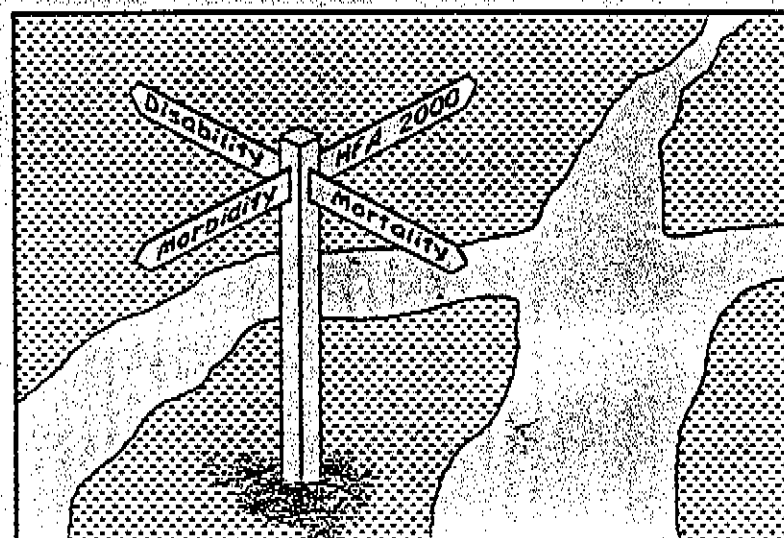
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INDICATORS AND METHODS FOR EVALUATING THE  
EFFECTIVENESS OF HEALTH INTERVENTIONS



An Initial Review Prepared by  
The Health Situation and Trend Assessment Programme  
WHO, Geneva, Switzerland  
September, 1986

4809K

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## KEY TO SYMBOLS USED

APR	Accident Prevention
ARI	Acute Respiratory Infections. Prevention and Control Programme
BIG	Biologicals
CAN	Cancer
CDD	Diarrhoeal Disease Control
CDS	Communicable Diseases
COR	Programme for External Coordination
CPA	Control Programme on AIDS
CVD	Cardiovascular Diseases
CWS	Community Water Supply and Sanitation
DAF	Action Programme on Essential Drugs
DTR	Diagnostic, Therapeutic and Rehabilitative Technology
ECV	Ecology and Control of Vectors
EHE	Environmental Health
EHE	Epidemiological Methodology and Evaluation
EPI	Expanded Programme on Immunization
ERO	WHO Emergency Relief Operations
FHE	Family Health
FIL	Filarial Infections
GES	Global Epidemiological Surveillance and Health Situation Assessment
HBI	Health and Biomedical Information Programme
HED	Health Education Service
HEE	Health of the Elderly
HLE	Health Legislation
HMD	Health Manpower Development
HMI	Information Service in the Programme of Health Manpower Development
HRP	Development and Research Training in Human Reproduction
HST	Epidemiological Surveillance and Health Situation and Trend Assessment
ICS	International Programme on Chemical Safety
IEH	Public Information and Education for Health
IPI	Programme on Intestinal Parasitic Infections
ISS	Information Systems Support
LAB	Health Laboratory Technology
LEP	Leprosy
MAP	Malaria Action Programme
MCH	Maternal and Child Health
NIE	Monitoring Implementation and Effectiveness
MIM	Microbiology and Immunology Support Services
MNH	Mental Health
MOE	Management and Organizational Effectiveness
MPN	Managerial Process for National Health Development
NCD	Noncommunicable Diseases
NUT	Nutrition
OCH	Office of Occupational Health
OCP	Onchocerciasis Control Programme in West Africa
OND	Other Noncommunicable Diseases
ORH	Oral Health
PAT	Programming and Training
PBL	Programme for the Prevention of Blindness
PDP	Parasitic Diseases Programme
PDS	Pesticides Development and Safe Use
PHA	Pharmaceuticals
PMO	Planning, Management and Operations
RAD	Radiation Medicine
RHB	Rehabilitation
RPD	Office of Research Promotion and Development
SCH	Schistosomiasis and other Trematode Infections
SHS	Strengthening of Health Services
SME	Smallpox Eradication
SMO	Smoking and Health
SRG	Programme of Essential Surgery
TDR	Special Programme for Research and Training in Tropical Diseases
TRI	Tuberculosis and Respiratory Infections
TRM	Traditional Medicine
TRY	Trypanosomiasis and Leishmaniasis
TUB	Tuberculosis
VBC	Vector Biology and Control
VDT	Programme of Sexually Transmitted Diseases
VPH	Veterinary Public Health

REVIEW OF INDICATORS AND METHODS TO EVALUATE THE EFFECTIVENESS  
OF CERTAIN HEALTH INTERVENTIONS

1. Introduction

Some countries are making good use of available information to monitor effectiveness and impact but others are neither fully using available data nor employing suitable methodologies for improving planning, management and evaluation. While certain proven methods should be more widely utilized, there is a need to develop simple but sound methods suitable for each level at which data is to be collected and used.

In June 1985, an Informal Working Group was convened in Geneva which reviewed indicators and methodologies used in developing countries in selected programme areas to evaluate the effectiveness and impact of prevention and control measures on the most common childhood diseases.<sup>1</sup> This was an initial step in an attempt to prepare a comprehensive inventory of indicators and methodologies, to identify common methodological trends that might be further developed or consolidated, and to recommend simplified methods of assessing the effectiveness and impact of health action which are specific, sensitive, relevant, applicable and affordable in developing countries. During the review, frequent references were made to the WHO document on the Development of Indicators for Monitoring Progress Towards Health for All by the Year 2000.<sup>2</sup>

As it was necessary to narrow the scope in a very broad and difficult subject, the Group decided that activities should be directed towards the needs of countries with infant mortality rates above 50 per 1000 live births and should concentrate on a selected group of severe health problems which affect similar target populations and for whose control there are clearly defined strategies with a strong evaluation element.

Applying these criteria, and realizing that the chosen approach was only an initial step in a prolonged effort, the group felt that it should first focus its attention on the components of national health strategies aimed at the prevention and control of childhood diseases, in particular, acute diarrhoea, acute respiratory infections, malaria, malnutrition and those diseases preventable by immunization. A limited range of indicators was considered for each of these, special emphasis being placed on sensitivity and simplicity.

Recognizing that each level of national health systems has its own needs and uses for data and their own resource limitations, methods were suggested for the collection of the data needed for the proposed indicators at each of three levels of the health service structure - local health area, regional and national. In doing so, the Group did not wish to recommend "universal" indicators and evaluation methods which should be advocated in all countries. On the contrary, it hoped to initiate work on the establishment of an array of indicators and corresponding evaluation methods which could be selected by countries according to their specific interest, needs and capabilities.

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<sup>1</sup> Report on an Informal Working Group on the Evaluation of Health Effectiveness and Impact, Geneva, 17-28 June 1985, document DES/EI/85.6.

<sup>2</sup> "Health for All" Series Number 4, World Health Organization Geneva, 1981.

Following the Informal Working Group meeting, contact was made with institutions in developing countries where there was a confirmed need to monitor more closely the effectiveness and impact of health programmes. A contractual agreement was concluded with Tanzania in 1985 and two more are being considered in Indonesia and Thailand. Under these agreements, the investigators will identify local information needs, choose indicators and methods to collect, analyse and use relevant information on effectiveness and impact trends at specific levels of the health systems. It is anticipated that towards the end of 1986, feedback will have already been obtained on the degree of success or failure that each of these projects will have attained. Furthermore, there are groups and institutions with bilateral collaborative projects in the world, especially in Africa, which have shown interest in the development of effectiveness and impact evaluation methods. A linkage with these groups, particularly the CDC Atlanta based "Combat Childhood Communicable Diseases" exists and will continue to be strengthened.

The Informal Working Group had also recommended that a review be made of methods applied to measure the effectiveness of interventions addressing other health problems than those listed above. Such a comprehensive review was carried out in WHO Headquarters through a series of meetings with managers and staff of a majority of WHO programmes. The present document, primarily intended for these programme managers and staff, includes individual summaries of findings. It also includes, in a tabular form, a list of certain health problems covered during the review together with an indication of the type of methods and indicators used to assess trends in effectiveness in relation to them.

It will be seen that the review did not only cover disease problems but also some critical issues of health development such as manpower, infrastructure, information systems, etc., for which effectiveness and impact should also be measured and monitored.

## 2. Effectiveness, review framework

In order to focus the present review, while remaining consistent with WHO definitions,<sup>1</sup> the term effectiveness has been used by the Group as a measure of changes in health status, resulting from specific intervention programmes affecting disease morbidity, mortality and/or disability.

Within this framework, answers were sought from managers and staff of various programmes in WHO Headquarters on the following questions:

- (a) For each relevant programme activity in developing countries, what specific indicators have been used or are being developed and tested to evaluate effectiveness?
- (b) For each indicator, what method or methods have been used or are being developed to provide the essential relevant information needed to measure effectiveness? If surveys are used, what type(s), what are

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<sup>1</sup> HFA Series Number 6 - Health Programme Evaluation and HFA Series Number 9 - Glossary of Terms used in the "Health for All" Series 1-8.

recommended sample sizes and universes, and how frequently are they carried out? If surveillance systems are used, how are they organized, what are the procedures and what are the coverage and biases? If sentinel areas are used, how are they defined, how do they operate and what are the coverage and biases? A similar description was requested for other methodologies used, including those based on censuses, routine data collections and other official statistics.

- Are standardized methodologies for evaluating effectiveness being used or recommended?
  - Are cost-effectiveness or cost-benefit analyses included in any of the methodologies being used or developed?
  - Is the evaluation of effectiveness incorporated in programme activities in all countries or only in selected ones? If the latter, what is the rationale for the selection?
- (c) How useful and meaningful are the indicators and methodologies used in terms of efficiently measuring programme effectiveness in developing countries?
- (d) Can samples of evaluation methodologies or protocols, data collection forms or other instruments, and tabulations of information be collected in developing countries for your programme activities?

### 3. Outcome of the review

The attached summary table 1 indicates, for each selected health issue, what has been the source of information for the review, what indicators and methods are used and what value has been accorded to them for the evaluation of effectiveness by the programme managers and staff interviewed. Table 2 is an inventory of health and health-related statistical information maintained by WHO which may be useful in assessing national or subnational trends.

Individual summaries, which have been made on each issue included in the review, figure in Annex. For each of these, additional sources of information and references are given. Any summarization of a complex series of operations is bound to lose potentially meaningful detail. This is true of summary table 1 where the actual indicator, e.g. incidence or prevalence of specific diseases, or the actual methods of measurement are not specified directly but classified into certain categories.

The categories of table 1, which are represented by column headings and sub-headings along with the contents of the columns, are explained below:

1. Column I, "Source of Information", refers to the WHO/HQ programme or unit providing information on the health issue addressed in the column to the left of column I. Several programmes or units may address the same health issue. The unit or programme is listed in parentheses if it uses the health issue as an indicator of programme effectiveness but is not primarily concerned with direct intervention or direct measures of health status in the health issue.

2. Column II refers to the use of direct health status indicators which evaluate effectiveness as defined above. In this column indicators are characterized by a judgement of how directly effectiveness is being measured by the programme:
  - 1 = a hard measure i.e. one which uses direct measurement of appropriate numerator and denominator data for the populations and time periods involved to measure changes in the targetted incidence and/or prevalence, mortality, or disability of the disease, or disability arising from it;
  - 2 = a firm measurement, which although directly related to the health intervention may be subject to measurement problems, e.g. proxy measures of morbidity, retrospective measures of mortality and morbidity;
  - 3 = a soft measure, where either the relation of the effectiveness measure to the health intervention is explainable by other intervening variables, or the measurements used may be biased or imprecise. A programme may propose several effectiveness indicators covering, at different degrees of hardness, a range of health interventions considered for a health issue. A (?) reflects a recognition that indicators appropriate for evaluation of programme effectiveness are still to be developed.
3. Column III relates to measures of programme effectiveness which do not meet the definitions of effectiveness used in this review, e.g. they utilize other measures of changed health status than morbidity, mortality or disability, or refer to other elements of evaluation such as efficiency, progress, or impact.
4. Column IV refers to measures other than health status, e.g. risk status of target populations for a disease, or practices in a target population thought to be protective for a disease.
5. Columns V and VI refer to methods using reporting from service-based records. An (X) indicates that this method is thought suitable as a method of collecting one or more of the indicators mentioned in columns II- IV. Column V refers to data generated by general health service delivery systems, e.g. reports of MCH clinics, routine reporting of EPI activities. Column VI refers to special local sentinel reporting mechanisms, clinics, local areas, specialized hospitals, etc. where special efforts are made to ensure more complete reporting of events.
6. Column VII refers to special population-based or institution-based disease registers set up for fixed periods of time to report on cases of specific diseases meeting certain demographic and/or clinical criteria.
7. Columns VIII and IX refer to methods utilizing population-based surveys carried out by national survey organizations on a routine basis, or by specialized national programme groups on an ad-hoc basis. Since many countries routinely carry out interview surveys on a national basis there exists the possibility of "piggybacking" specific disease modules consecrated to measuring morbidity and/or mortality from these diseases. The letters A, B and C indicate the appropriateness of piggybacking on this vehicle to measure the indicator. Column IX refers to surveys where clinical and/or laboratory measurements are made on the sampled population in addition to questions posed by interviewers.
8. Finally Column X refers to special studies such as Primary Health Care reviews, vector density surveys, specially designed longitudinal surveys, school surveys, factory surveys etc. which are specific to special programmes. The opportunity for "piggybacking" information for other programmes exists in many of these studies.

#### 4. Conclusions of the review

Although the present review is more a description than an analysis of methods being used or developed by various programmes to evaluate the effectiveness of health interventions, several conclusions can be drawn from the exercise which point to further action:

1. Many programmes which originally concentrated on the development of indicators of programme efficiency, and whose principal concern was to evaluate their programme's process, have now reached a stage in the evolution of programme activities which calls for indicators of effectiveness to evaluate health interventions in terms of changes in health status of the target populations.
2. These programmes have had difficulties in devising methods to measure appropriate indicators of health status change which could be carried out at the national level in a precise and cost-effective fashion. In addition, several programmes not dealing with specific disease prevention and control have had difficulties in defining the specific health changes which could be ascribed to health interventions carried out by the programme.
3. Programmes could profitably collaborate on defining indicators of effectiveness, and on jointly developing measurement methodologies. The notion of "piggybacking" specific health status modules on other survey activity would appear to be promising, given the frequency with which programmes mentioned surveys as one method of measuring health status levels.
4. Given the rapid evolution of programme focus and on changing programme targets an update of this review should be carried out within a two-year time frame.

Information contained in this review can provide a framework for collaboration between programmes, and HST could play a coordinating role in rationalizing methodological problems in the evaluation of effectiveness.

REVIEW OF SELECTED INDICATORS AND METHODS FOR EVALUATING  
EFFECTIVENESS OF HEALTH INTERVENTIONS

SUMMARY TABLE 1

1 = hard indicator  
2 = firm indicator  
3 = soft indicator  
A = Definite possibility  
for piggy backing  
X = Potential method in  
non survey situations

B = Some possibility for  
piggy backing  
C = Not suitable for piggy  
backing  
X = Potential method in  
non survey situations

HEALTH ISSUES	Source of Information	INDICATORS			METHODS					
		Health Status		Other (Risk etc.)	Service Status		Special and vertical collection (Registry)	Surveys		Other vector, density, PHC review etc.
		Direct (green book)	Other direct, indirect		General	Localized (sentinels, etc.)		Inter- view	Non Inter- view	
I	II	III	IV	V	VI	VII	VIII	IX	X	
1. NCH (including NUT and FP)	FHE/HRP	1	1,2	3	X	X	A	A	B	
2. Diarrhoeal Diseases	CDD (FDP, EHE)	1, (2)		3			A		A	
3. Acute Respiratory Infections	CDS/IRI/ARI	1			X		A		A	
4. Immunization against Measles, Tetanus, Typhoid, Diphtheria, Polio	EPI	1,2	1,2		X		A	A	A	
5. Tuberculosis	CDS/IRI/TUB (EPI)	1	(3)		X			A		
6. Malaria	MAP (VBC)	1, (2)	2, (3)	(3)	X		(?)	A	A	
7. Onchocerciasis	OCP, (FDP)	1	1		X	X		A	A	
8. Other Parasitic Diseases										
a. Filariasis	FDP/FLL, (OCP)	1	1,2		X	X		A	A	
b. Schistosomiasis	FDP/SGH	1	1		X			A (A/B)		
c. Intestinal Para- sitic Infection	FDP/IPI	1	1		X	X		A		
d. Trypanosomiasis	FDP/TRV	1	2		X			A	C	

SUMMARY TABLE (continued)

HEALTH ISSUES	Source of Information	INDICATORS				METHODS				
		Health Status		Other	Service Status	Special and vertical collection (Registry)	Surveys		Other vector density, MHC review etc.	
		Direct (green book)	Other direct, indirect	(Risk etc.)			General	Localized (sentinels, etc.)		Inter-view
I	II	III	IV	V	VI	VII	VIII	IX	X	
9. Other Communicable Diseases	I	II	III	IV	V	VI	VII	VIII	IX	X
a. Rabies	CDS/VPH	(?)	2 (?)	1,2,3 (?)	X (?)	X (?)	X (?)	(?)	A (?)	C (?)
b. Salmonellosis (other zoonoses)	CDS/VPH				X	X	X			
c. Leprosy	CDS/IEP	1,2			X	X	X			
d. Sexually Trans. Diseases	CDS/VDT	1,2			X	X	X			
e. AIDS/SIDA	CDS/CPA	1,2,3	2	1	X	X	X		A	A/B,C
10. Vision Acuity and Blindness.	CDS/PEL (OCP)	1			X	X	X	(A)	A	
11. Mental Disorders	MNH		(3)	(3)	(X)	(X)	(X)	(A/B)		
12. Metabolic Disorders (Diabetes)	NCD/OND	1		2,3	X	X	X			A
13. Cardiovasc. Diseases	NCD/CVD (SMO)	1,2	1	3	X	X	X	A		A, (C)
14. Cancer	NCD/CAN (SMO)	1	2, (1)	3						A, (C)
15. Oral Health	NCD/ORH	1								B, (C)
16. Occupational Health	NCD/OCH	(1)	(2/3)	(3)	(X)	(X)	(X)	(?)	A	B/C
17. Environmental Health	EHE	3, (3)	2	3, (2) (3)	(X)	(X)	(X)	(?)	(?)	(?)
18. Accidents	APR				(X)	(X)	(X)	A, (?)	(A)	A/B, C
19. Aging	HEE									
20. Rehabilitation	DTR/RHB	1	3		X					B



TABLE 2

**Inventory of Health and Health-Related Statistical Information  
Maintained at WHO Headquarters**

<u>DIU/Unit</u>	<u>Contact Person</u>	<u>Title</u>
CDD	D. Salmon	CDD Research Proposals and Letters of Intent
CDD	J. Tulloch	Management Information System Data Base
CDS/EAM	K. Esteves	AIDS Case Count
CDS/EAM	K. Esteves	AIDS Epidemiology
CDS/LEP	J. Gambke	Latest Available Statistics on Leprosy
CDS/MIM	J. Esparza	Dengue/Dengue Haemorrhagic Fever Occurrence
CDS/PBL	B. Thylefors	Blindness Data Bank
CDS/SME	J. Wickett	Expenditure for Smallpox Eradication
CDS/SME	J. Wickett	Worldwide Smallpox Incidence
CDS/VDT	G. Antal	Yaws Occurrence
CDS/VPH	K. Vogel	Rabies Surveys
COR/ERO	O. Elo	Emergency Relief Operations
DAP	E. Lauridsen	-none-
DTR/PHA	J. Dunne	"UN Consolidated List of Products whose Consumption and/or Sale have been Banned, Withdrawn, Severely Restricted or not Approved by Governments"
DTR/RAD	E. Lehtinen	TLD Intercomparison
EHE/CWS	G. Watters	Country External Support Information (CESI) System
EHE/CWS	G. Watters	National and Global Water Supply and Sanitation Monitoring System
EPI	C. Chan	EPI Information System
FHE	E. Royston	Coverage of Maternity Care
FHE	E. Royston	Maternal Mortality Rates
FHE/MCH	M. Belsey	Infertility
FHE/MCH	R. Guidotti	Low Birth Weight
FHE/MCH	M. Carballo	Prevalence and Duration of Breast Feeding
FHE/NUT	W. Keller/ A.Pradilla	Anthropometry
FHE/NUT	A. Pradilla/W.Keller	Percapita Energy Availability and Family Consumption
HBI	B. Cooper	-none-
HMD/HMI	F. Mawson	World Directory of Medical Schools
HMD/HMI	F. Mawson	World Directory of Schools of Public Health
HST	L. Roy	Global Indicator Data Base
HST/GES	H. Hansluwka	Health Personnel
HST/ESM	J. Duppenthaler	List of Persons

**NOTE:** This inventory was carried out by the HSATAP Working Group on Data Bases, WHO Headquarters, June 1986.

The Working group does not maintain a file of the statistical information listed above. Requests for this information may be sought directly from each individual programme.

**Inventory of Health and Health-Related Statistical Information  
Maintained at WHO Headquarters**

<u>DIU/Unit</u>	<u>Contact Person</u>	<u>Title</u>
HST/GES	H. Hansluwka	Morbidity by Age and Sex
HST/GES	H. Hansluwka	Morbidity by Seasonal Period
HST/GES	H. Hansluwka	Mortality
ICS	M. Mercier	-none-
MAP/EME	J. Hempel	Areas where Resistance of <i>P. falciparum</i> to Chloroquine is Reported
MAP/EME	J. Hempel	Detailed Status of Antimalaria Activities
MAP/EME	J. Hempel	Follow-up of Official Register
MAP/EME	L. Molineaux	Global Monitoring of Susceptibility of Malaria
MAP/EME	J. Hempel	Imported Malaria in Europe
MAP/EME	J. Hempel	Malaria Country Information
MAP/EME	J. Hempel	Malaria Risk in International Travel
MAP/EME	J. Hempel	Official Register of Areas where Malaria Eradication has been Achieved
MAP/PAT	V. Ivorra Cano	Global Inventory of Malaria Personnel
MAP/PAT	R. Kouznetsov	Malaria Country Information
MNH	W. Gulbinat	Mental Health Statistical Information System
NCD/CAN	K. Stanley	Maintained at IARC, Lyon
NCD/SMD	R. Masironi	Tobacco and Health
OCP	J. Marr	OCP Aquatic Monitoring
OCP	J. Marr	OCP Entomological Data Base
OCP	J. Marr	OCP Epidemiological Data Base
ORH	J. Sardo-Infirri	WHO Global Oral Data Bank
PDP/FIL	B. Duke	Global Prevalence of Filarial Diseases
PDP/IPI	Z. Pawlowski	Prevalence of Ascariasis in Africa
PDP/SCH	K. Mott	Distribution of Schistosomiasis
PDP/TRY	P. Cattand	PHC Approach to Control and Prevention of Sleeping Sickness
SHS/MIE	C. Montoya-Aguilar	"Analyzed Information on Accessibility, Coverage and Use of Services in 40 Developing Countries"
SHS/MOE	D. Smith/E. Webster	SHS Programme Information
TDR	K. Hata	Management Information Systems (MISTR)

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## ANNEX

SUMMARIES OF INDICATORS AND METHODS FOR EFFECTIVENESS  
AND EVALUATION MENTIONED BY SELECTED WHO PROGRAMMES

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HEALTH ISSUE: MCH and FAMILY PLANNING

SOURCE OF INFORMATION: FHE, (MCH), Dr M. A. Belsey 5 March 1986  
supplemented by written comments on 3 July 1986 and  
28 July 1986

Indicators Perinatal mortality, maternal mortality, (proportion of maternal mortality due to principal preventable causes,) pregnancy in women less than 16 and over 35, pregnancy with spacing less than two years, percentage of women aged 15-45 using some form of family planning, percentage of women aged 15-45 having two doses of tetanus toxoid, proportion of deliveries exhibiting obstructed labour, incidence of neonatal tetanus, low birth weight (see Nutrition).

Methods The above indicators can be sought through routine reporting, confidential enquiries of causes of maternal death, and cluster sample surveys.

Details and Comments

It is the view of this programme that indicators for monitoring impact on conditions of maternal and child health must necessarily vary depending on the state of development in the country and the stage of the health system and its administration. Maternal mortality rates can be obtained from special studies or improved routine reporting. The proportion of maternal mortality due to main preventable causes can be obtained through confidential enquiries or through special studies. Perinatal mortality is perhaps more appropriate for use within the more developed countries whereas an indirect measure of perinatal mortality such as the incidence of neonatal tetanus is recommended for less developed countries. A system of dynamic or evolutionary effectiveness indicators is still under development. In order to substantiate the concept and to provide methodological guidelines these will be the subject of a variety of country level efforts at indicator measurement. Thus, at the moment, efforts are being made to foster and support studies on maternal mortality in different national settings.

A number of the indicators listed above, particular those reflecting the results of service delivery, such as the proportion of women practising some form of family planning and the proportion of women having been immunized with tetanus toxoid, will be monitored using improved programme review methods such as the cluster sampling approach widely practised in EPI and now being extended for use in PHC reviews. Family Health and MCH are actively involved in developing designs and analytic procedures for improving the MCH/FP indicators within the PHC review methodology.

HEALTH ISSUE: Nutrition

SOURCES OF INFORMATION: NUT, Dr A. Pradilla

22 July 1986

Indicators Weight for height of children 12-24 months of age, height for age of children 1-4 years, birth weight and length, evidence of Vitamin A deficiency (Bitot spots and night blindness), evidence of iodine deficiency (cretinism, goitre), percentage of total deaths represented in the under-five age group, evidence of anaemia (Hb), evidence of adequacy of food supply (such as a national food balance sheet). Obesity indices and diets.

Methods Primarily measured through samples of available data or through surveys. Involves checking of birth records and consultation registers as well as other sources.

Details and Comments

Considerable developmental effort is on-going in the monitoring of impact on nutrition, particularly in countries involved in JNSP, and on the inclusion of selected indicators of nutrition in reviews of EPI and PHC. From these two basic types of experience the above indicators will be further developed and methodologies will be documented. A booklet on Nutrition Assessment Guidelines is in the process of being published.

HEALTH ISSUE: Diarrhoeal Diseases  
SOURCE OF INFORMATION: CDD, Mr R. Hogan

19 February 1986

Indicators (Current) Under-five mortality rate  
" " diarrhoea-associated mortality rate  
" " diarrhoeal death ratio  
" " annual diarrhoea incidence rate

(Under study) Other measures of mortality (e.g., indirect estimation of early childhood survival) and factors associated with diarrhoea.

Methods Baseline and follow-up cluster sample surveys, based on a standardized design and an eight-item questionnaire developed by CDD, carried out by MOH personnel.

Details

The indicator of primary interest has been diarrhoea-associated mortality - specifically, the rate among children under five years of age. In the interest of giving greater attention to the preventive, as opposed to curative, efforts of the programme, CDD has been investigating additional and alternative measures of mortality and of diarrhoea-associated factors. Among the latter are breastfeeding, weaning and hand washing practices and the availability and use of safe water and proper sanitation (latrines).

The survey method developed by CDD was designed to be carried out quickly and easily by MOH personnel in developing countries without the need for extensive training. It was also designed to be inexpensive and to produce accurate and reliable results. The eight items in the questionnaire ask for minimal information on diarrhoea morbidity, mortality and treatment. To date, some 160 surveys have been carried out. Sample sizes have averaged less than 10 000 and individual survey costs are under US \$5000. The cost of surveys is normally borne by the MOH, but if funds are lacking, CDD provides financial support upon request. WHO staff or consultants have provided short-term assistance at the beginnings of baseline surveys. Surveys have been carried out in most countries with CDD programmes. In some countries, such as China, it is felt that mortality surveys are not needed. A method for measuring cost-effectiveness is being developed. Such analyses can be undertaken at the time of assessing overall ORT programmes.

Comments

CDD is optimistic but cautious as regards the utility of the survey method, although few follow-up surveys have been carried out and the replicability of survey results has not been tested to date. The survey method is currently under review because the mortality and incidence rates frequently appear to be too "soft" - that is to say, they seem too low, are of questionable accuracy and lack narrow enough limits of precision. In large part, this reflects sample sizes that have been too small. In addition, annual rates based on fixed-point surveys may not be able to cope adequately with the seasonality of diarrhoeal diseases. The one-year recall period for mortality data is known to produce under-estimations and recently the accuracy of mothers' statements on treatment have been questioned. CDD is currently developing detailed guidelines on training and supervision for its surveys in order to overcome these problems.

For additional information on the method see Manual for the Planning and Evaluation of National Diarrhoeal Diseases Control Programmes (WHO/CDD/SER/81.5 Rev.1 [1984]).

HEALTH ISSUE: Acute Respiratory Infections  
SOURCE OF INFORMATION: CDS/TRI/ARI

27 March 1986

Acute Respiratory Diseases (ARI)

Area	Indicator	Method
Epidemiological	Infant and 1-4 mortality rate	) Routine vital statistics
	Infant and 1-4 ARI-related mortality rate	
	Infant and 1-4 ARI death ratio	
	Incidence of ARI in infants and 1-4 year old children	
		) Cluster-sample surveys
		) Health services statistics
		) Cluster sample surveys
		) Sentinel information systems
		) Longitudinal surveys
Operational	Proportion of moderate and severe cases	Sentinel Information systems
	Treatment coverage of moderate and severe cases	
	Proportion referred to higher health care level	
	Clinical outcome of treatment	
	Case fatality ratio	
	Proportion PHC workers trained in ARI	
Sociological	Current practices of mothers regarding ARI	KAP surveys

Details and Comments

At present some 40 countries have initiated health systems research or feasibility projects on ARI and five countries have started a national control programme to be implemented in a phase manner. Although the design of health systems research and feasibility projects is unique to the country, they tend to share common features and serve as sentinel information centres. Areas covered by these projects vary, depending on the estimated ARI-related mortality rates, the smallest being of about 5000 up to 12 000 children under 5 years of age, with some of them used for longitudinal epidemiological studies. Baselines are established by census and followed by household visits at an interval of 14 days to record morbidity events, and six months to record mortality events. Verbal autopsies are carried out to identify, insofar as possible, causes of death.

A survey method has been developed on the basis of CDD design and methodology. A questionnaire of seven items provides minimal information on ARI morbidity, mortality and treatment. It is currently being tested. The sample size need not exceed 10 000. A manual for national ARI programme managers on the planning, implementation and evaluation of the programme has been developed. It provides detailed instructions regarding programme monitoring and evaluation, including recording and reporting.

HEALTH ISSUE: Immunization against Measles, Tetanus, Pertussis, Diphtheria, Polio

SOURCE OF INFORMATION: EPI, Dr J. Keja

25 February 1986

Indicators Incidence, prevalence and mortality rates for EPI diseases.

Methods EPI has developed standard methods that are complementary, including the 30x7 baseline diagnostic survey, ad hoc surveys of particular diseases, routine reporting procedures, sentinel and local area monitoring, and national programme reviews.

#### Details and Comments

As national EPI programmes evolve, the focus and targets for evaluation, and the appropriate indicators and methods, change. The original 30 x 7 cluster survey was developed and introduced as part of training courses. The method served well as a fast, easy and inexpensive means of providing immunization coverage estimates. On average, the 30x7 surveys require one man day for planning, 15-30 man days for field work and less than one man day for analysis. Early surveys were carried out by nations with or without WHO technical assistance, but they are now exclusively in the hands of nationals. It is probable that around 2000 such surveys have been carried out and, for the most part, EPI is now encouraging their use only for validating routine coverage statistics.

Cluster surveys for estimating the prevalence of poliomyelitis lameness which in turn provides an estimate of incidence have been carried out in communities and schools. EPI is now discouraging further surveys of polio lameness on the grounds that enough is known. Similarly, measles mortality surveys were important in Southeast Asia in demonstrating the seriousness of the disease, but additional surveys are not warranted. On the other hand, surveys on neonatal tetanus, which was thought to be rare, are being promoted as the seriousness of the disease is becoming more evident.

The survey methods used for diagnostic disease baselines are inadequate for follow-up and measurement of effectiveness. Other unipurpose survey methods are equally undesirable because, as EPI coverage increases, extremely large samples are required to obtain accurate results and costs become prohibitive. Consequently, EPI has adopted a number of other approaches which provide relatively inelegant measurements of incidence which, in combination, permit the establishment of trends, even if somewhat inferentially. EPI has limited confidence in routine service statistics because they are not only incomplete but inconsistently incomplete and late in being reported. Instead, it relies more on reporting from sentinel and proposed local area monitoring schemes. The former are rural, community or facility based, while the latter may consist of whole municipalities or selected facilities within 26 municipalities. EPI recognizes that these are not truly representative, but feels that reporting from these areas is at least consistent. The principal drawback to the sentinel-local area monitoring method, however, is that population changes in the surveillance areas, particularly migration, can change the character of catchment areas rather rapidly. Therefore, there is need to develop methods to compensate for this problem if trend analyses and evaluations of effectiveness are to be made with confidence.

## EPI (continued)

Finally, EPI promotes and supports national programme reviews which should be repeated every 2-3 years. Review teams are made up of WHO and other outside personnel (e.g., from USAID, SIDA) and national staff involved in EPI and related projects. EPI covers costs of its staff and consultants and sometimes provides up to US\$5000 in local expenses. Reviews typically take 3 weeks in the country: the first week at the national level, the second at the local, and the third spent collating both impressionistic and objective information and preparing recommendations. Sometimes one or two people remain in the country for an additional week to draft the final report. The reviews provide a total view of programme progress and have been very popular.

Additional information is on file and available from EPI. See especially, Evaluation and Monitoring in the Expanded Programme on Immunization (EPI/18/445/6).

HEALTH ISSUE: Tuberculosis

SOURCE OF INFORMATION: CDS/TRI/TUB, Dr J. Leowski

27 March 1986

Indicators and Methods

TUBERCULOSIS

<u>Area</u>	<u>Indicator</u>	<u>Method</u>
Epidemiological	Annual decrease in risk of infection	Tuberculin surveys in young children.
	Prevalence of tuberculosis	Sample surveys in population
	Percentage of cases undetected	
	Protective effect of BCG vaccination	Contact and case-control studies (controlled field trials)
	Incidence of tuberculosis (in lower age group)	Longitudinal studies
Operational	Case detection ratio	) Health service reporting Sample surveys in relevant age groups BCG assessment studies
	Case holding ratio	
	Case fatality ratio	
	Relapse rate	
	BCG vaccination coverage	
	BCG induced tuberculin sensitivity	
	BCG induced complications	)
Sociological	Awareness	Sample surveys
	Motivation	

Details and Comments

In a well-developed programme, morbidity and mortality rates are derived from routine service statistics. Annual infection rates, indicating the magnitude of the problem, are derived from surveys, usually of children under 6 years of age or by extrapolation from surveys of 6, 7 and 8 year-olds. Surveys are repeated. Infection rates are more easily obtained than incidence but serve essentially the same purpose because there is a close relationship between the two. An infection rate of 1% approximates an incidence rate of 50-60/100 000 general population. Child contact and case control studies are also used to assess the effectiveness of BCG. TRI aims for a 80% cure rate per year, but the numbers are usually lower.

TB indicators and methods for evaluating control programmes are well-established, standardized and widely used. A new manual (revised) has just been published by PAHO.



MAP (cont'd)

In order to heighten awareness and increase demand for control and treatment of malaria, health education programmes could be mounted. Their effectiveness would be evaluated by means of KAP (knowledge, attitudes and practices) surveys combined with health service statistics, at first in trial areas and subsequently nationally.

Documentation for evaluation of long-term effectiveness does not exist at present.

HEALTH ISSUE: Onchocerciasis  
SOURCE OF INFORMATION: OCP, Mr J. Marr

20 February 1986

Indicators

Vector density  
Annual transmission potential (number of O.volvulus transmitted  
Annual biting rate (number of vector bites per year)  
Community microfilariae load (% of microfilariae carriers in a  
community sample).

Methods

Vector density: vector collectors; examination of breeding  
sites; "sentinel" fly traps.  
Other indicators: longitudinal cohort cluster sample surveys at  
three-year intervals; cross-sectional sample surveys 7-8 years  
after programme begins.

Details

Vector collection is carried out over 12 hours periods at fixed intervals ranging from daily to monthly according to site. Epidemiological cohort surveys cover 125 villages of about 300 people each, purposely selected to include the different endemicities of onchocerciasis. Number of villages diminished to under 40% of original by the third round. The survey of one village cluster of about 300 people takes about one week and is carried out by OCP project staff normally consisting of two to three professional and six general service workers. Assessment of cost-effectiveness is an ongoing activity.

Comments

General assessment of the evaluation activities is that they are excellent and comprehensive and will continue to be so under OCP. Transfer of responsibilities for evaluation and monitoring to national governments will require some training and probably adjustments in methods. Investigation of how to accomplish this without loss of reliability of results is being carried out in connection with the new country areas added to the OCP.

For additional information see Ten Years of Onchocerciasis Control in West Africa: Review of the Work of the Onchocerciasis Control Programme in the Volta River Basin Area from 1974 to 1984 (OCP/GVA/85.1B), and A. Prost & N. Prescott, "Cost-effectiveness of blindness prevention by the Onchocerciasis Control Programme in Upper Volta," Bulletin of the World Health Organization, 62(5): 795-802 (1984).

HEALTH ISSUE: Filariasis

SOURCE OF INFORMATION: PDP/FIL, Dr B. Duke

4 March 1986

Indicators Vector density; vector transmission potential; numbers of persons at risk of infection; incidence and prevalence of infection; intensity of infection; incidence and prevalence of disease.

Methods Based on methods developed for surveys of filarial diseases (including those used in OCP).

Details and Comments

The three public health problems of primary concern to FIL are onchocerciasis, lymphatic filariasis and dracunculiasis (Guinea worm). FIL is principally involved in research and works closely with OCP, TDR and VBC, among other WHO programmes. In theory it is also linked to EHE for guinea worm control. FIL is involved in relatively few ongoing projects and programmes in developing countries, but gives advice and technical assistance when a country has a disease problem or wants a review or assessment of its control programme to be carried out.

Outside the OCP and the few country programmes in which FIL is involved, there is a paucity of reliable baseline data on the distribution and intensity of the three principal diseases mentioned above. The diseases, while generally widespread, are not evenly distributed, and surveys are the normal means of generating baseline data. With the exception of Guinea worm, which can be eliminated, comprehensive control programmes may serve to reduce morbidity rather than infection. Control tends to be expensive and only in relatively few countries do the diseases rate a high priority with governments. The main long-term hope is to develop better drugs. One, Ivermectin, may be available for onchocerciasis within a year and this should help to prevent blindness. Otherwise there is a lack of weapons; but early detection and treatment with DEC through PHC can control its spread and reduce the level of morbidity. The effectiveness of this measure is being assessed by the number of patients presenting themselves for treatment and the numbers of attacks of filarial fevers.

Guinea worm could be eliminated country by country. India has made the disease reportable and initiated a programme which consists of active case searching to determine incidence, treatment, control and prevention. The last includes installation of safe water supplies and health education. Elimination of Guinea worm in a village or other area is declared following a three year period without any cases being detected. In principle, the elimination of Guinea worm is easy, given sufficient governmental and community motivation. The effectiveness of such a programme would obviously be measured by the diminution of the the Guinea worm, and the method of evaluation would be case detection.

HEALTH ISSUE: Schistosomiasis  
SOURCE OF INFORMATION: PDP/SCH, Dr K. Mott

12 March 1986

Indicators      Prevalence of infection, Morbidity, Intensity of infection

Method            Numerator analysis of data collected by health personnel making diagnosis and providing treatment.

Details and Comments

If conducted outside the health care system, monitoring and evaluation (whether by surveys, sentinel areas or surveillance systems) are too expensive and unjustified. Even diagnostic and baseline surveys should be discouraged under these circumstances. Instead, the needed data should be collected as a routine part of a control programme. In the case of SCH, it would be best in most developing countries to start with administrative units (e.g., health districts) rather than at the national level. One person in a health facility can diagnose and treat about 100 people a day.

Intensity might be obtained from a sample of patients by microscopic analysis. Data could be cumulated on a monthly basis, and within a fixed period - perhaps one year - the baseline could be fixed. Evaluation of effectiveness would be determined by changes in prevalence and intensity of infection, or morbidity, over time. Morbidity is the more important, however, since prevalence may not drop much as a significant reduction in morbidity is achieved.

Morbidity can be measured to some extent by the numbers of cases being hospitalized. Methods suitable for use in developing countries to assess morbidity are still being developed. However measured, morbidity is the best long-term indicator (long-term meaning five years in this instance). Incidence is not a useful indicator since, where SCH is endemic, reinfection often follows on the heels of cure. When viewed as a medical rather than a biological problem, reducing morbidity is more important than purging an individual of all parasites - at least until means of eradicating the disease altogether are found.

Although morbidity in children correlates well with intensity of infection, measurement of intensity of infection by quantitative parasitological examinations may not be feasible. Urinary schistosomiasis is manifested in children by gross haematuria or microscopic haematuria. The rates of haematuria and association with intensity of infection vary from endemic area to endemic area. Reduction of rates of haematuria would provide an additional monitoring instrument to confirm the effectiveness of chemotherapy.

Liver and spleen enlargement in children due to S. mansoni or S. japonicum infection also correlate with intensity of infection. However, the use of these measurements by health services, unless reported systematically from school surveys, would not be useful. Epidemiological field research has demonstrated the validity of this simple procedure of physical examination both for confirmation of the endemicity of schistosomiasis and as a monitoring instrument to confirm the effectiveness of chemotherapy.

SCH control programmes are facility-based and depend upon the availability of equipment and personnel. They can be incorporated into the primary health care system once the feasibility has been demonstrated and costs measured.

SCH (cont'd)

SCH is preparing an atlas of schistosomiasis which will give estimated ranges of prevalence and update information published in L. S. Iarotski and A. Davis, "The schistosomiasis problem in the world; results of a WHO questionnaire survey," in Bulletin of the World Health Organization, 59 (1): 115-127 (1981). See also Schistosomiasis Control: A Primary Health Care Approach (WHO/SCHISTO/83.71).

HEALTH ISSUE: Intestinal Parasitic Infection  
SOURCE OF INFORMATION: PDP/IPI, Dr Z. Pawlowski

20 February 1986

Indicators Prevalence, intensity and distribution of intestinal parasitic infections (IPI)

Methods Population surveillance and sample surveys are recommended.

Details

Stool examinations provide data on infection and worm load for the over 20 IPIs of concern. The indicator(s) selected will depend upon the main parasitic problems of a country or area. Nevertheless, ascariasis prevalence is especially recommended as an indicator because, although it is the most resistant of the infections in this group, the mean life span of adult worms is less than a year, and the infection is especially common among the key target populations of children under five and school-age children.

Surveillance is most conveniently based on health institutions and facilities and could be established using existing health information recording and reporting systems. In addition to drawing information from the usual MOH facilities, surveillance could be carried out through school health, day care and workers' health programmes.

The type of design adopted for sample surveys will vary according to national circumstances and sample sizes will vary according to expected prevalence rates. Samples of less than 2000 will suffice in almost all cases. Where data are lacking, a diagnostic survey should be carried out. This may also serve as the baseline survey. Follow-up surveys are recommended at two-year intervals. Surveys are carried out by MOHs, institutes of public health or other agencies. WHO staff involvement is largely limited to national and regional training seminars. Surveys based on schools are especially convenient but community-based programmes are most desirable. Survey costs are small. One person can examine about 50 individuals a day, and the cost per stool examination is about US \$0.03. In Korea, for example, the government contracts with the Korea Association for Parasite Eradication at a rate of US \$0.10 per child for all work. The Association performs some 13 million examinations a year. Over a 12-year period, ascariasis prevalence decreased from 60% to 12% in the target population.

Comments

The procedures for monitoring IPI and evaluating programme effectiveness are easy, fast and very inexpensive. They readily lend themselves to incorporation into any contact programme. Unfortunately, they are not used as widely as they should be. It is recommended that they be incorporated in water and sanitation and health education programmes.

For additional information see "Surveillance and Survey Methodology for Intestinal Parasitic Infections (IPI)" (PDP/85.4).

## HEALTH ISSUE: Trypanosomiasis

SOURCE OF INFORMATION: FDP/TRY, Dr P. de Raadt and Mr P. Cattand 14 March 1986

Indicators Coverage: ratio of no. people seen vs. estimated population at risk; Prevalence: ratio of no. of new cases vs. total no. people sampled; ratio of advanced cases to "early" cases.

Methods Routine service statistics from fixed facilities and mobile teams; any data obtained from published or unpublished sources for development of country profiles.

Details and Comments

Surveillance, control and treatment programmes for sleeping sickness have been established for approximately 30 years, using both mobile teams and fixed facilities for detection and treatment of cases. TRY has developed an experimental Trypanosomiasis Control Manual which includes model daily logs and day books for mobile teams. Data from these teams and static service points would provide adequate information for monitoring and evaluation were it not that most data never reach the central level. In addition, individuals may be counted more than once (and seen more than once in a given period) while all parts of the country may not be visited each year or even every few years. These factors obviously make evaluation and interpretation of trends difficult and somewhat uncertain. Thus, TRY views the indicators and methods as useful but far from sufficient. It is estimated that perhaps 10 of the 36 countries concerned do a reasonably good job, but in none is there complete coverage within a year. MOHs are responsible for all phases of programmes; however, bilateral teams are important in a few countries, notably Zaire, Sudan and Uganda.

TRY tries to improve the situation in several ways. It organizes national training courses addressed to workers at the implementation level and follows these up with support designed to improve data collection and evaluation as well as case detection and control. TRY also uses these occasions, and others that present themselves, to build up its data bank on national programmes. It collects, organizes and analyzes such data and reports back to national authorities. The country profiles, using a standardized format, are constructed from the data bank, which is continuously updated, corrected and expanded from any source that can provide useful information. TRY does this as a service to national programmes as well as for its own monitoring of global trends. The procedures and format of profiles are still being tested and refined. All things considered, this approach would seem to be very suitable for a programme such as TRY. The indicators are straightforward and easily derived from routine service statistics. The coverage indicator, while perhaps technically one for efficiency, is in this case also viable as an effectiveness indicator.

For additional information see Trypanosomiasis Control Manual (WHO, Geneva, 1983); Country profile draft (TRY, on file); and, A.P.M. Shaw and P. Cattand, The cost of different approaches towards the control of human African trypanosomiasis (TRY/EC/WP/85.17).

HEALTH ISSUE: Rabies, Salmonellosis, Other Zoonoses  
 SOURCE OF INFORMATION: CDS/VPH, Dr K. Bögel,

26 March 1986

1. Rabies given as the principal example because indicators and methods are most fully developed.

Indicators Exposure and treatment frequencies; mixed/indirect ratios; ecological density ratios.

Methods Routine service statistics from vaccination and treatment centres; data from rabies surveillance centres; epidemiologic-ecological surveys; mapping of interrelated variables.

#### Details and Comments

A large number of indicators are possible, the selection depending upon country conditions and capabilities. What would be viewed as efficiency indicators in other circumstances are used as effectiveness indicators for rabies programmes where it may be argued that the two are indistinguishable.

Indicators are classified in one of five groups: (1) Health indicators, such as human exposure to rabies called for treatment and numbers of people treated. (2) Service indicators, including numbers of dogs vaccinated and removed, numbers of animals examined and density of cases of rabies (dogs) per square kilometre. (3) Mixed indicators (most important), such as the ratio of animals positive on testing to the number of humans treated. This is an excellent indicator of the effectiveness of the surveillance and detection system. (4) Ecological indicators, including a human/animal ratio (taking into account animal population density and mobility criteria), prevalence of intense farming practices, prevalence of particular practices for animal waste disposal. (5) Administration and management-indicators, which are not effectiveness indicators (e.g., legislation, committees, national plans, etc.).

There are no fixed guidelines for the design of surveys, which will vary according to objectives. Mapping methods might include plotting cases of both human and animal cases detected against population density, locations of hospitals and other vaccination and treatment centres, and surveillance areas. Well-handled, this method can reveal much about programme effectiveness at sub-national levels.

For additional information see Planning and Formulation of Comprehensive National Programmes in Zoonoses Control, a paper prepared in 1982 by Dr K. Bögel, VPH.

2. Other zoonoses: Indicators and methods are being developed. These situations are somewhat more complicated than rabies. Thousands of actions occur along the line from field to table to produce, or prevent, tainted food products. VPH is primarily concerned with the production and processing of products rather than the end use. Signs of conditions presenting health risks to consumers are usually detectable in animals at the time of slaughter. Unfortunately, numerous governmental and international agencies are involved along the line of production and processing, and much better understanding and intersectoral cooperation is badly needed in developing countries. For VPH, evaluation is complicated by the fact that FAO oversees slaughterhouses and the training of meat inspectors, while all expert committees on hygiene, at all levels, come under WHO. At present, although badly needed, there are no guidelines, for example, for the use of veterinary drugs. The significance of veterinary drug residues for human health is essentially unknown, and no evaluation is possible in such areas.

HEALTH ISSUE: Leprosy

SOURCE OF INFORMATION: CDS/LEP

26 March 1986

Indicators      Prevalence rates of registered cases; Proportion registered among estimated cases; case detection rates; Proportion of children 0-14 among newly detected cases; proportion disabled; relapse rate.

Method            Data routinely collected by vertical LEP national programmes.

Details and Comments

A full list of recommended indicators may be found in the WHO TRS No. 716, pp. 54-57. A recommended model patient form for collecting the data is to be found on paper 58 + 59 of this document.

National LEP programmes have existed for many years but coverage is not complete. LEP is currently concentrating on improving the data base to monitor the global picture. It also carries out or assists in evaluations of costs and cost comparisons. LEP supports national programmes through promotion, technical assistance and workshops. The responsibility for running programmes rests with national governments, although there is substantial bilateral and NGO participation in some national programmes. Through informal reports from nationals, donors and others, LEP has built up a set of files at HQ on numbers of cases, numbers of patients and numbers under treatment.

Assessment of the proportion of patients that are disabled is limited to newly detected cases for several reasons. A general disability rate carries large backlogs and is not serviceable except, perhaps, over very long periods of time. Moreover, in cases of leprosy, disabilities become worse over time, owing to injuries, etc. For such reasons it is considered better to assess deformity and disability at the time of case detection.

For additional information see, especially, Epidemiology of Leprosy in Relation to Control (WHO Technical Report Series, 716; WHO, 1985); OMSLEP: Recording and Reporting System for Leprosy Patients (Epidemiology Unit, Catholic University of Louvain, Brussels, and WHO, 1983 [Second Edition]); and, Basic Epidemiological Indicators for Monitoring Leprosy control (Department of Epidemiology, Catholic University of Louvain, Brussels, published by Sasakawa Memorial Health Foundation, Tokyo).

HEALTH ISSUE: Sexually Transmitted Diseases

SOURCE OF INFORMATION: CDS/VDT, Dr G. Antal

4 August 1986

Indicators: The objective of STD control activities is to reduce the transmission of sexually transmitted diseases and in particular to prevent their complications. Relevant indicators of programme effectiveness have been detailed in paragraph 8.2 of the Global Medium Term Programme (VDT/MTP/83.1) viz:

"8.2 Indicators to be used to measure programme effectiveness at national level:

- Changes in STD infection rates (gonococcal culture, syphilis serology) in unbiased antenatal population groups (if possible urban/rural).

In case of inability to establish above indicator, the following are very good proxy indicators:

- Changes in percentages of patients admitted to gynaecological wards for pelvic inflammatory disease.
- Changes in incidence of ectopic pregnancies identified in hospitals per number of live births delivered in the same hospitals or their catchment areas."

Methods: Ad Hoc Population-based Serological Surveys  
Routine Service Statistics.

HEALTH ISSUE: AIDS

SOURCE OF INFORMATION: CDS/CPA, Dr J. Mann

1 October 1986

Indicators      Incidence of cases.  
                  HIV infection rate  
                  Incidence of "marker" conditions (e.g. tuberculosis, parasitic  
                  viral diseases)

Methods        Institutional reporting  
                  Serosurveys

Details and comments

Countries are still in the process of evaluating the extent of the AIDS problem and establishing prevention programmes. These assessments provide more a qualitative appraisal of magnitude and nature of the problem than a quantitative estimate of the problem in the population at large. Evaluation activities are currently focused on the efficiency of prevention programmes, in particular health education.

Morbidity, as measured by the number of cases of AIDS is the most frequently used indicator of trends. Few data are available on AIDS mortality, although the assumption is that 100% of clinical AIDS cases will die within 5 years of their onset. The specificity of the morbidity indicator varies with the local ability to identify cases clinically and immunologically. The sensitivity of the indicator is largely related to local willingness to acknowledge AIDS as a problem and to diagnostic capabilities. In the USA for example, it is estimated that 90% of cases are reported to national health authorities while in a tropical country, in another Region, none of the many cases that are known to have been confirmed has so far been officially reported.

Serosurveys to estimate HIV infection rate have been carried out in specific population groups (homosexuals, drug users, prostitutes, blood donors and receivers, military personnel), but their expansion to broader population groups, or to the population at large, faces ethical, logistic and financial constraints. It has been noted, however, that the ratio of cases to seropositive individuals may evolve over time, for example from 1/500 to 1/25 in a specific group of an urban population. This indicator is not yet sufficiently refined and the lack of confidence in case ascertainment compounds the problem. While surveillance of cases, focal investigation of these cases and seroprevalence studies represent the mainstay of AIDS status and trends measurement, there are proxy indicators which could be envisaged. For example, AIDS has an influence on the prevalence of and mortality from tuberculosis which may therefore be useful as a "marker" of AIDS incidence. Similarly, the incidence and severity of parasitic or viral diseases (schistosomiasis, malaria, measles etc.) should be further explored as a marker of HIV prevalence.

Other proxy indicators should be investigated such as fertility rate, fetal loss rate, congenital malformations, and neurological (or other) disease/impairment rate, and mortality in specific age and sex groups (for example in young adults of each sex). More information may be obtained from Curran, J.W., Morgan, W.M. Hardy, A.M. et al. The Epidemiology of AIDS: Current Status and Future Prospects. Science 1985; 229: 1352-7.

HEALTH ISSUE: Eye Diseases and Visual Impairment  
SOURCE OF INFORMATION: CDS/PBL, Dr B. Thylefors  
1986

8 July

Indicators Incidence and prevalence rates for specific conditions and ocular diseases; visual impairment and blindness rates.

Methods Sentinel clinic and/or community health workers' reports; random community KAP surveys; school-based surveys of children 10; surveys of preschool children and adults years.

Details and comments

Indicators for use at the PHC and referral levels are grouped into short-term (0.5-2 years: no. of operations performed; no. and severity of active cases of trachoma and xerophthalmia detected), short to medium-term (0.5-5 years: village-level random sample surveys of (1) pre-school children for active xerophthalmia [night blindness, Bitot's spots] and trachoma; (2) adults over 50 years of age for blinding cataract and trichiasis; and, (3) community KAP concerning eye care; and, long-term ("Definitive prevalence survey for blindness from corneal disease [by cause], cataract, and other disorders [glaucoma and posterior segment disease])).

Short-term indicator data may be derived from surveys of clinic and/or CHW records, or community or school-based surveys of children under 6 and under 10, respectively, for trachoma and xerophthalmia. Medium-term indicator data may be collected at 5-year intervals for adults over 50, for example, taking samples of 500-2000 in one or more communities. These surveys use standard forms (the revised form is currently being field-tested). The essential items can be obtained by a clerk and auxiliary nurse, who can examine about 200 individuals a day, completing field work in a week to 10 days, depending on the sample size and other factors. Optional information is collected from cases with vision loss by an ophthalmologist. Including driver, a maximum of 4-5 people are required to carry out a survey. The method is also good for long-term evaluation. KAP protocol has not been developed.

All evaluation is carried out by the MONs, with technical assistance provided by PBL or the NGOs on request. PBL also participates in training exercises. PBL strongly advises that evaluation be built into blindness prevention programmes, and that cost-efficiency studies be included (operational and treatment cost studies with respect to cataract and other conditions).

PBL has provided a total of US\$150 000 to six countries in all Regions to carry out training and field-testing of protocols for assessment and evaluation. A comprehensive programme review, vis-à-vis PBL, and the development of the evaluation system are included in these projects.

At present, evaluation of effectiveness is carried out in only selected countries. The reasons are that some old, as well as new programmes do not have adequate evaluation procedures and capabilities. Moreover, where rates are very low, there is no need to report and monitor trachoma.

For additional information, see Report of a task force on evaluation mechanisms for programmes for the prevention of blindness, Geneva, 26-30 March 1984 (WHO/PBL/84.9), and accompanying eye examination forms.

HEALTH ISSUE: Mental Disorders  
SOURCE OF INFORMATION: MNH, Mr W. Gulbinat

20 February 1986  
and 1 April 1986

Indicators First admission and re-admission rates and length of stay, by age, sex and other characteristics.  
Psychosocial and behavioural indicators to be developed.

Methods Routine service statistics.  
Ad hoc surveys.

Details and comments

Guidelines for routine data collection on admission and length of stay at mental health/psychiatric facilities are being developed, both with respect to in-patients and to out-patients. MNH does not favour or recommend the use of surveys and censuses for routine data collection or for monitoring, evaluating and planning. However, survey methodology has been developed and field tested for the assessment of utilization of health and social services by the mentally ill. Such ad hoc surveys and special surveys prove to be useful and appropriate for baseline and diagnostic purposes and for the evaluation of mental health programmes. It is also possible for certain types of information on mental health to be collected in conjunction with other surveys - e.g., national household surveys.

Appropriate indicators and methods for evaluation of psychosocial/behavioural factors associated with health and mental health are needed for developing countries. Special studies should be undertaken to develop and test them. Basic psychosocial/behavioural indicator data should be included in the collection of routine service statistics. However, it is recognized that the development of such information systems will be slow in many developing countries. It follows that, for the time being, the type of indicators for mental health should be adjusted to the health statistical infrastructure in the country concerned and should be based on easily collected data and straightforward methods.

For additional information see Mental Health Services Statistics: A Tool for Mental Health Planning (MNH draft document) and Health and Mental Well-being in National Planning (draft report of a meeting held in Brussels, 26-28 June 1985).

HEALTH ISSUE: Smoking

SOURCE OF INFORMATION: NCD/SMO, Dr R. Masironi

12 March 1986

Indicators Changes in knowledge, attitudes and practices (KAP); per capita tobacco consumption; daily consumption rate.

Methods Sample, small area and institution-based surveys, and data collected by tobacco companies, FAO, World Bank and USDA.

Details and Comments

SMO has a set of model questionnaires recommended for use in all countries to generate KAP data. A number of baseline surveys have been conducted in developing countries using a variety of sampling methods. In Argentina, a telephone survey proved useful, but generally surveys are taken of selected groups for convenience - such as university students, factory workers. It follows that the actual surveys can be done relatively quickly (in a matter of a month or two), but the total period, from initial planning through reporting, may take up to six months. Surveys are also taken of physician KAP. Smoking surveys are relatively easy and inexpensive. Occasionally WHO technical assistance is provided and up to US \$2000 may be provided for a survey in selected developing countries. Minimum samples of 1000 subjects are recommended to provide information by sex; larger samples are required to obtain more useful data by sex and age groups. SMO involvement is mainly limited to participation in regional and subregional workshops. As yet, follow-up surveys have been carried out only in a few developing countries, so evaluation is currently possible only for these countries. Smoking and tobacco use control programmes are new in developing countries, or do not yet exist, so there will probably be at least a five-year delay before follow-up surveys will make it possible to evaluate effectiveness in these countries.

A great deal of information is collected by tobacco companies and published by FAO, the World Bank, and the United States Department of Agriculture on the production, sale and use of tobacco products around the world. These are also useful for monitoring trends and effectiveness in countries where programmes for tobacco control exist.

SMO effectiveness evaluation is ideally suited for coupling with other country activities. SMO may have especially close linkages with CVD and hypertension surveys but a minimum set of questions relevant to evaluation SMO programme effectiveness could be attached to almost any other type of survey - e.g. oral health, maternal health/family planning, indeed almost any face-to-face encounter situation. A minimum of two questions need to be asked: do you regularly smoke? and how much per day? For national monitoring, it would seem that the most useful link-up would be with any national representative survey, but perhaps most desirable would be a national household survey. In each case, the essential demographic and socioeconomic information being collected for other purposes would also provide useful detail for comprehensive evaluation of changes in the use of tobacco products.

For additional detail, see Guidelines for the conduct of tobacco smoking surveys of the general population (WHO/SMO/83.4), and Guidelines for the conduct of tobacco-smoking surveys among health professionals (WHO/SMO/84.1).

HHEALTH ISSUE: Cardiovascular Diseases

SOURCE OF INFORMATION: NCD/CVD, Drs S. Bothig and S. Dodu 2 April 1986

1. MONICA Project: A ten-year study of trends in CVD over the period 1984-1994. Forty-one centres in 26 countries are participating. China is the only developing country included.

Indicators:

"Hard" - Coronary (and partly cerebrovascular) morbidity and mortality rates.

"Soft" - Risk factors: blood pressure and lipid levels, weight/height, smoking.

Methods:

Continuous monitoring of mortality data by means of routine service statistics collected by the participating centres. Morbidity data are collected by special myocardial infarction registers, in half of the participating centres (including China), also by stroke registers. Soft indicators and background variables are collected by random sample surveys at the beginning (baseline) and end of the ten-year period (final). A mid-term survey is optional. Surveys are age standardized with a minimum of 200 participants of each sex and age group (25-34 if possible, 35-44, 45-54, 55-64) for total samples of 1200-1600.

Documents:

1. Proposal for the Multinational Monitoring of Trends and Determinants in Cardiovascular Disease and Protocol. (MONICA Project), WHO/MNC/82.1 Rev.1, May 1983.
2. Monitoring Trends in Cardiovascular Disease and Risk Factors: the WHO "MONICA" project, H. Tunstall-Pedoe, WHO Chronicle, 39(1): 3-5 (1985).

## NCD/CVD (continued)

2. Prevention and control of Rheumatic Fever/Rheumatic Heart Disease (RF/RHD) in developing countries. The programme includes 16 countries, with at least three in each Region, except for the European Region.

Indicators: - RF recurrence rates;  
- coverage rate for secondary prophylaxis.

Method:

Detection and prevention through secondary prophylaxis are organized and managed in countries by Ministries of Health. Children (5-15 years) are the main target group, and case detection is carried out in schools and children's clinics. Service statistics based on a register of RF/RHD patients provide the basis for evaluating the coverage for secondary prophylaxis. The target is to cover not less than 70% of registered RF/RHD patients.

Comments:

The efficacy of a full prophylaxis regimen is known to prevent recurrences of RF in more than 90% of cases. Consequently, the coverage of a properly administered prophylactic regimen, as defined here, constitutes a sound measure of programme effectiveness.

Documents:

1. The Community Control of Rheumatic Fever and Rheumatic Heart Disease. Report of a WHO meeting held in New Delhi, India, 21-23 November 1979. WHO/CVD/80.3, WHO, Geneva (1980).
2. Prevention of RF/RHD - Guidelines for Country Plan of Operation.
3. Prevention and Control of Rheumatic Fever in the Community. Manual of operational standards for a program to extend coverage at different levels of care. Pan American Health Organization, 1985. Scientific Publication No. 399.
4. Development of Methodology for the Prevention and Control of Cardiovascular Disease in Primary Health Care in Developing Countries. Report of a meeting of investigators. Geneva, (18-21 June 1985. WHO/CVD/85.5. WHO, Geneva (1985).

NCD/CVD (continued)

3. Prevention and control of hypertension, RF/RHD and diabetes as part of district planning and management for PHC. This programme is being developed in collaboration with SHS in two districts in Tanzania.

Indicators:

Blood pressure measurements carried out; RF/RHD patients detected and followed up for secondary prophylaxis; urine tests for glucose - diabetics detected and treated; community awareness of these three diseases and of the effectiveness of their prevention and control.

Method:

Routine service statistics collected by PHC workers who are trained to carry out the necessary measurements and treatment procedures and to advise patients, families and the general public on the health education aspects of prevention and control of noncommunicable diseases.

Document:

1. Non-communicable diseases in primary health care - prevention and control of hypertension, rheumatic fever/rheumatic heart disease and diabetes - guidelines for the trainers of PHC workers (in preparation).

HEALTH ISSUE: Cancer

SOURCE OF INFORMATION: NCD/CAN, Dr J. Stjernsward

28 February 1986

Indicators

Process measures: such as tobacco consumption for prevention programmes, coverage for vaccination programmes and screening programmes, manpower, legislation (tobacco, pain relief drugs) and reallocation of resources to new priorities in cancer control.

Outcome measures: such as incidence and mortality rates for control programmes under development.

Methods

Data for process evaluation measures come from surveys (i.e., tobacco habits, effect of education programmes), industry statistics (i.e., tobacco consumption), national legislation (tobacco and drugs) and national resource statistics (programme facilities, manpower development).

Data for incidence and mortality come from cancer registries, national health statistics, surveys, and hospital records.

Details and Comments

The aims of cancer control programmes are to prevent cancers from occurring, detect cancers early in their course, provide effective therapy, and provide pain relief and continuing care for cancer patients. Evaluation of the effectiveness of programmes in each of these areas requires different approaches; effectiveness of cancer pain and therapeutic programmes generally can be measured in just a few years, but preventive programmes may require a decade or more if incidence or mortality data is used for evaluation.

Of the two major types of evaluation measures, process and outcome measures, evaluation by an outcome measure, commonly cancer specific mortality, is clearly desirable. However, in the field of cancer (and many other diseases) the time between a health intervention and the observation of effect on the disease outcome is often measured in decades. For example, about 30% of cancers worldwide are associated with tobacco, either smoking or chewing, and the time between the cessation of a tobacco habit and a reduction in lung cancer incidence is approximately 10-15 years. The time between a childhood education anti-tobacco programme and the inception of lung cancer or between vaccination of newborns for hepatitis B virus and the inception of liver cancer is 30-40 years, or more.

In general, a stepwise preference scheme for evaluation is necessary. A simplified version is given below.

Principles of evaluation: a stepwise preference scheme

<u>Evaluation Terminology</u>	<u>Prevention Programmes</u>	<u>Early Detection Programmes</u>	<u>Treatment Programmes</u>	<u>Pain Relief Programmes</u>
1. Process measure/ foundation	Political commitment in reallocation of resources and plan of action	Facility availability and capacity	Facility and medication availability	Pain relief drug availability
2. Process measure/ implementation	Effectiveness of education programmes in changing behaviour/ coverage by vaccination	Coverage of proper risk group and quality control	Professional education	Education for proper pain relief treatment
3. Short-term outcome	Reduction in ancillary illnesses and symptoms	Shift in distribution of disease stage at time of diagnosis	Control of tumour at hospital level	Specialized hospital short-term pain relief
4. Medium-term outcome	Incidence reduction	Reduction in advanced disease rate	Hospital population survival increase	Central and district hospital pain relief
5. Long-term outcome	Mortality reduction	Mortality reduction	Population mortality reduction	Population-based pain relief

The evaluation tools utilized in a specific situation will depend on the particular strategy, the time between action and observed effects, the availability of statistical information, and the reliability of process measures in predicting outcome measures.

Clearly, evaluation strategies should differ as more is learnt about specific strategies. For example, there is no need to require each local tobacco control programme to monitor rates of lung cancer. Sufficient studies exist which have monitored the smoking rates over time by age group and have linked these trends with lung cancer and cardiovascular disease morbidity and mortality. Process measure evaluation, i.e., tobacco consumption by age group, is quite sufficient. Similarly there is no need to correlate the coverage of cervical cancer screening with reduction in cervical cancer mortality in every country where cytology screening is underway. Provided the screening procedures are correctly carried out in the correct age groups and the results are used appropriately, measures of coverage and referral can provide entirely reliable predictors of mortality reduction. In summary, there is no need to reinvent the wheel (in medical research terms) in each country and demand the establishment of costly infrastructures, such as cancer registries, as a condition for being able

## NCD/CANCER (SMO)

to evaluate and monitor the effectiveness of established interventions. Once the effectiveness of an intervention on morbidity and mortality has been clearly established in the various social-economic-cultural situations, less expensive process measures and sampling approaches can be used and the direct indicator of disease reduction can be replaced by proxy indicators of the efficiency and coverage of implementation of the intervention. Cost-effectiveness is important for evaluation as well as for planning.

HEALTH ISSUE: Oral Health

SOURCE OF INFORMATION: NCD/ORH, Drs Infirri and Tala

24 February 1986

Indicators Global target is 3 or fewer Decayed Missing or Filled Permanent Teeth (DMFT) age 12 (the indicator is mean number of DMF permanent teeth at age 12).

Methods Stratified cluster sample survey using standard protocol. Standard reporting form, summarization programme and reporting system. Data is classified, collated and stored in the Global Oral Data Bank.

### Details

The global target for 12 years is one of a set of 5 that have been jointly defined by WHO and the International Dental Federation (FDI). The indicator used serves to measure the effectiveness of preventive and curative services available to younger cohorts and can be used to estimate the general oral health situation of adults in the population. A series of other specific indicators are available for older age cohorts.

The standard survey method, which is strongly recommended for national monitoring and evaluation systems, uses a "National Pathfinder Sample" of 300 12-year old children. Twelve clusters are chosen to reflect different urban-rural, geographic and socio-economic groups. Clusters of 25 are either taken from schools or schools and surrounding communities. On average, one person can examine 60-80 children a day, and complete field work in one week. Total time, from start to finish (including analysis, which can be done by hand), and write-up requires one man month. Monitoring surveys to be repeated every 3-5 years. For a minimum follow-up, examinations/surveys can be completed in a week's time or less. Professional staff are not required. WHO staff or consultants have conducted some surveys; otherwise, WHO involvement is mainly to assist with analysis, reporting and promoting utilization of results. Field work is usually carried out by the MOH or personnel from the Ministry of Education.

The Global Oral Data Bank contains at present data on caries from 137 countries, and on periodontal disease from 103 countries. From these data and known disease patterns, ORH is able to make well based estimates for remaining age cohorts for countries lacking data other than for 12 years.

### Comments

Cost/effectiveness is measured in a number of ways, two of the more useful being use of primary health care and let referral level services, related to improvements of oral health, and staff turnover, in light of the training required.

The survey method for oral health assessment is well-tested, internationally accepted and suitable for all countries. Since 1970 an average of 15 national pathfinder and 10-15 non-national sample surveys have been conducted each year. This method and the standard recording and reporting system are well-suited also to be incorporated into an overall health assessment system.

Where well organized schools or community oral health clinics exist, their responsibilities could well be expanded to other age cohorts, their functions diversified to include general health monitoring and early referral to

appropriate care. In situations where primary health care services are being established, basic oral health monitoring and preventive care/advice should be incorporated. Monitoring of oral health and hygiene is particularly easy and can be performed by all kinds of health and non-health personnel and could well be used as a general indicator of personal hygiene and self care.

See also "Proposed Evaluation Methods for the Project: Testing a Community Model in Oral Health, Chiang Mai, Thailand" (ORH/ERP.CTTEE.THAI/85.9) Oral Health Surveys: Basic Methods (WHO, 3rd Ed. 1987).

HEALTH ISSUE: Occupational Health

SOURCE OF INFORMATION: NCD/OCH, Dr M. El Batawi

20 February

1986

Indicators

Various, depending on type and nature of working situation. Injury/accident rate by type of work place; work-related illness rate; risk factors.

Methods

Surveys, routine reporting systems. Almost any method may be suitable.

Details

Better methods of reporting information need to be developed, but there is no shortage of potential indicators for effectiveness. Still, indicators must be specific and appropriate to the occupation and work place. Thailand has carried out a large stratified sample survey on occupational health to obtain diagnostic and baseline data. The sample totalled about 50 000 workers from 100 factories. The survey was carried out over an 8-month period.

Comments

There should be no shortage of simple and inexpensive methods for collecting information even in developing countries. Factory or other facility-based health clinics would seem to be ideal, both for routine monitoring and evaluation of risks, accidents, etc., and for carrying out special studies on occupational health and hazards. Ad hoc surveys, and data collection as part of other types of surveys (such as national household surveys), would also seem to be appropriate. For generation of most data, from facilities that are well-defined and bounded, like a factory, the responsibility would probably best be vested in the health officer at the site or some other person in a good position to gather information on a routine basis.

For further information please see Epidemiological Approaches to Planning and Development of Occupational Health Services at a National Level (unpublished WHO document by M. A. El Batawi, Chief Medical Officer, Office of Occupational Health, and C. Husbunrer, Director, Division of Occupational Health, Ministry of Health, Bangkok, Thailand.)

HEALTH ISSUE: Rural and Urban Development and Housing  
SOURCE OF INFORMATION: EHE/RUD, Mr R. Novick and Dr A. Prost 12 March 1986

Indicators None

Methods None

Comments

Environmental health in rural and urban development and housing (RUD) is a programme area that is so broad and interrelated with other things that it is not possible to devise useful indicators and methods to evaluate effectiveness. The priorities for RUD are to sensitize governments in developing countries and to get action started, then to see what countries are doing. The last could be catalogued by WHO staff in the regions and countries. The first thing to do would be to determine whether or not countries have adopted policies, developed programmes and committed staff to RUD concerns. Thus, for the time being, the foci of evaluation should be on programme starts, progress and adequacy. It would be premature, for some time to come, and counterproductive, to attempt to evaluate efficiency - much less effectiveness.

RUD may be described as a "quality of life" programme, and there are no general indicators for quality of life. Any indicator of effectiveness would have to be both culture and class defined and take into account specific environmental factors. Thus, measures of housing density, or crowding, are of no practical value in measuring quality of housing. Given the experience of the developed countries, the outlook for being able to evaluate programme effectiveness in developing countries is bleak.

HEALTH ISSUE: Prevention of Environmental Pollution

SOURCE OF INFORMATION: EHE, Mr G. Ozolins, Dr M. Mercier & Dr A. Prost

27 March 1986

Indicators More than 100, mainly relating to risks to health, including SO<sub>2</sub> levels (air quality), levels of radioactivity, pesticides in food, water and humans, and incidence of poisonings. Progress of national programme development.

Methods Numerous and varied; e.g., continuous or periodic monitoring at fixed sites, by mobile units, via surveys or data from poison control centres, special area studies, and periodic ad hoc assessments.

Details and Comments

The effects on human health of exposure to chemicals and other agents in the environment are essentially impossible to quantify at this stage, the main reason being that humans are subjected to multiple exposures to more than one pollutant over long periods of time, and the aetiology of tissues and conditions related to such exposure is largely unknown.

The next best thing is to monitor indicators of exposure, e.g. contaminants in food, air and water. In some cases the contaminants can also be measured in human tissue and fluids. Trends can be observed and in certain cases the levels may be related to expected health effects and estimates can be made of "populations at risk". Thus a measure of programme effectiveness can be obtained. The CEH programme promotes the monitoring of environmental quality in Member States and collects information for global analysis and presentation.

In all there are some 50 to 100 indicators relating to industrial pollutants on which routine monitoring data are available.

Another measure of programme effectiveness is the assessment of national environmental pollution control programmes in terms of their capability. Indicators of such capability include availability of legislation, standards, enforcement procedures, laboratories, monitoring stations, manpower, etc.

These programme areas have numerous linkages with other WHO programmes, ranging from OCH and TRI through VPH, and with other agencies, e.g., UNEP, FAO, IBRD.

Extensive documentation on indicators and methods is available in the various publications in the series GEMS: Global Environmental Monitoring System. See also, Preliminary Assessment of National Programmes for Health Protection against Environmental Hazards (PEP/85.8).

HEALTH ISSUE: Community Water Supplies

SOURCE OF INFORMATION: EHE/CWS, Messrs. O. Sperandio, K. Schultzberg, Jackson  
J. Jackson and A. Prost 24 March 1986

Indicators Coverage, functioning and utilization of facilities; diarrhoeal disease morbidity rates.

Methods Minimum Evaluation Procedure (MEP) using methods appropriate to the situation; Case control studies in collaboration with CDD.

Details and Comments

The MEP was designed to provide answers to questions relating to the three groups of outcome indicators: Were facilities built as intended, and do they function and are they utilized as intended? Specific indicators relate to the quality, quantity, reliability and convenience of facilities, the proportion of households using facilities and the volumes used and for what purposes. The MEP makes use of available data, ad hoc surveys or other means of obtaining answers to the questions. The procedure is subjective in that it does not strive for statistically accurate results but rather an understanding of the acceptability and utility of facilities in relation to the population they are intended to serve. A national MEP can be carried out within a year (from initial planning through final reporting) for about US \$10 000 or less. The MEP is thus relatively quick, inexpensive and straightforward.

The case control method has been tested in collaboration with CDD. It was selected to overcome time and cost factors associated with longitudinal surveys. However, it remains difficult to attribute changes in diarrhoeal morbidity among children under five years of age to CWS projects alone, or, for that matter, to any specific intervention. For such reasons, studies and attempts to evaluate effectiveness of specific programme activities in relation to disease incidence, prevalence, morbidity and mortality rates must be handled with extreme caution. The impact of a water supply and/or sanitation project on health depends on the hygienic practices of the people concerned. If other routes of pathogen transmission are open, the impact might not be significant and maybe not even measurable. Health impact studies are research oriented and require resources not normally available to the implementing agencies. This type of research is needed, not as a matter of routine, but rather to establish the efficacy of a new type of intervention. The MEP type of evaluation is normally sufficient as it can be assumed that a properly functioning and utilized facility is a necessary, but not sufficient, component to improve the level of community health to an acceptable level.

While CWS recommends standard procedures, it is the responsibility of governments to carry out MEPs. CWS provides assistance on request but very little in the way of financial support. MEPs carried out have been supported by bilaterals, UNICEF and the World Bank. CWS concludes that the MEP is very useful in identifying weaknesses and areas for improvement in water supply and sanitation programmes.

For additional information see Minimum Evaluation Procedure (MEP) for Water Supply and Sanitation Projects (International Drinking Water Supply and Sanitation Decade, Publication No. 6, WHO, Geneva, May 1985); Maximizing Benefits to Health ... An appraisal methodology for water supply and sanitation projects (ETS/83.7); Measuring the Impact of Water Supply and Sanitation Facilities on Diarrhoea Morbidity: Prospects for Case-control Methods (WHO/CWS/85.3//CDD/OPR/85.1); and other documents on file.

HEALTH ISSUE: Food Safety

SOURCE OF INFORMATION: EHE/FOS, Dr F. Käferstein and Dr A. Prost

10 March 1986

Indicators None at present. Potentially, knowledge, attitudes and practices (KAP) in food handling.

Methods None at present feasible for developing countries. KAP surveys  
a possible solution.

Details and Comments

Evaluation of the effectiveness of food safety programmes within the framework of the definitions in HFA Series no. 6 (Health Programme Evaluation: Guiding Principles) is exceedingly difficult, if not impossible, and any attempt would be premature. Few developing countries have well-organized food safety programmes and those that exist are in the early stages of development. It may be possible to evaluate programme management in terms of progress, adequacy and efficiency, and it might be argued that indicators identified as measuring efficiency could serve to measure effectiveness as well. It may further be argued that below a certain level of socio-economic development effectiveness of these programmes cannot be measured in terms defined in the HFA series. For example, incidence rates for food-borne diseases and food poisoning are extremely difficult to obtain and may be considered impracticable simply because of the time and costs involved. In addition, results defy interpretation even in studies conducted in developed countries because, among other things, the proportion of all cases actually identified or reported is unknown, and there are other factors and agents involved. For the same reasons, morbidity and mortality rates may be considered inappropriate or misleading as indicators.

Consequently, FOS is concentrating on other approaches to assess programme progress, adequacy and, to a degree, efficiency. The main evaluation method is the annual national programme profile which is compiled by a questionnaire sent to WPCs. This covers legislation, policy, and programme development, but cannot give an answer to the most important question about the end-use of food products in the home. In connection with this effort is the use of international meetings on food safety to promote the development of programmes. Every two years, the delegates to these meetings report on food safety progress, and this provides at least a subjective measure of progress and perhaps of effectiveness in the longer run, if not in the shorter. In connection with this effort, FOS, in collaboration with FAO, has developed a provisional set of Guiding Principles on evaluation of programmes to ensure food safety (WHO/EHE/FOS/86.1/FAO/ESN/MISC.(86.1). Although this is a well-developed document, it is seen as essentially a promotional tool for national programme development and a first step toward the refinement of indicators and methods suitable for developing countries. However, the critical question of end-use remains, and this is where the best effectiveness indicators must ultimately come from.

A possible solution to measuring effectiveness of FOS programmes in developing countries may be the use of KAP-type surveys (baseline and follow-up). These could be combined with other evaluation surveys on related subjects, such as other EHE surveys or those carried out in connection with MCH, NUT, CDD or other programmes. A national household survey would also be a very good vehicle.

HEALTH ISSUE: Rehabilitation

SOURCE OF INFORMATION: DTR/RHB, Dr E. Helander

25 March 1986

Indicators      Number of steps of progress made by participants in community-based RHB programmes;  
Community satisfaction.

Methods          Routine service statistics from PHC workers;  
Community committees.

Details and Comments

The RHB system of monitoring and evaluation is specifically designed for simplicity and ease of use at the PHC level. Simple model patient record and monthly reporting form have been developed for PHC workers. They have been tested during the past year, mainly in SEARO countries. A manual is being prepared. The PHC patient form has 22 items against which a date is given, as appropriate, when a participant in the programme progresses from one step to another - e.g., graduating from being unable to feed oneself alone, to managing sometimes or with some help, and finally to being independent in this activity. Monthly reporting forms, currently being filled out by local supervisors at the first referral level but intended to be completed eventually by PHC workers, give the change in numbers of disabled persons participating in community-based RHB programme and the number of disabled people who made at least one step of progress during the month. These reports are consolidated at the next level. Evaluation is based on annual progress statistics. Community satisfaction, as assessed subjectively by community committees made up of RHB programme participants, will be the final evaluation goal. Committees are yet to be organized, and this element of evaluation will come in the future.

RHB programmes at the community level currently exist in few countries. For the time-being, evaluation will be based on indicators such as the development of national plans and policies, programme starts, achievement of targets for participation and coverage of the disabled - i.e., indicators not considered to assess effectiveness.

HEALTH ISSUE: Development of PHC

SOURCE OF INFORMATION: SHS, Dr C. Montoya-Aguilar

25 February 1986

Indicators There are no indicators of effectiveness of the development process for PHC as such and the most useful indicators are therefore those for the effectiveness of the elements themselves. E.g. morbidity, disability, mortality rates; nutritional status measurements (e.g., age/height/weight).

Methods Analysis of existing data from any source; collection of new data by site visits and surveys.

Details and Comments

SHS, in a collaborative study with countries, has developed standardized concepts and definitions for use in evaluation of health systems - including the effectiveness of such systems.

An interdivisional team, with active participation of SHS, HST, EPI, MCH, CDD and other programmes, produced a manual and prototype instruments for conducting Joint Primary Health Care Reviews by countries and WHO. The protocol contains seven questionnaires for use from the national to the household level. The basic design is derived from the EPI country reviews, and uses similar sampling methods for household surveys. These methods, however, are currently under review. Within the last two years, Primary Health Care reviews have been carried out in 12 African countries. As in the case of the EPI reviews, field work is carried out by joint national and WHO teams during a 3-week period. Usually, 3-4 WHO staff members have participated.

For additional information see National Assessments of Health Coverage and of its Effectiveness and Efficiency (SHS/83.7); A Manual for Conducting Primary Health Care Reviews (SHS/PHC/REVIEW/84/0); Draft revision of "Guidelines for Conducting Primary Health Care Reviews", by Waldman and Rigau, and, Review of Primary Health Care: Prototype Protocols (SHS/PHC/REVIEW/84/1-7).

HEALTH ISSUE: Manpower Development

SOURCE OF INFORMATION: HMD, Dr D. Ray and Dr V. Alexeev

27 February 1986

Indicators Specific effectiveness indicators are being developed and tested.

Methods Heretofore information on achievement of targets was provided by Member States through Regional Offices. Comprehensive country reviews, made up of joint WHO-MOH teams, which take three weeks in-country, have been carried out in seven Member States. The method is being refined for general use.

#### Details

Indicators are based on MTP targets. HMD has drafted a "catalogue" of indicators for use by developing countries, either on their own or with help from WHO. The catalogue (and guidelines for evaluation) is expected to be ready for publication around the end of 1986.

The method used previously was inadequate because information provided for many countries was unreliable. The new method of country reviews is similar to others used in WHO. It depends on smaller teams and is less expensive than the PHC reviews, hence is more akin to the EPI method. The HMD method is currently under review and is being streamlined for general use. At present, country reviews are supported by WHO but it is expected that they will become funded from local sources.

#### Comments

Cost-benefit and cost-effectiveness analyses have not been included in evaluations but the feasibility of doing so is to be investigated.

HMD participated in the development of the PHC country review method and in carrying out PHC reviews in collaboration with SHS. In developing the method for the HMD comprehensive country reviews, and in conducting reviews in selected countries, HMD sought to identify and test suitable specific indicators of effectiveness for each MTP target. Many of the indicators used by HMD might be classified as indicators of adequacy or efficiency. Thus, appropriate effectiveness indicators will be developed as programmes mature and the need for such indicators increases. However, at certain stages of development, such indicators are of more direct practical use than indicators of pure effectiveness, which is to some extent a remote concept in manpower planning and development.

HEALTH ISSUE: Laboratory Support to PHC

SOURCE OF INFORMATION: DTR/LAB, Dr L. Houang and Dr D. Vazquez 25 March 1986

Indicators Suitable indicators for laboratory support to PHC in developing countries need to be developed. Ratio of clinical diagnoses to laboratory confirmed diagnoses could serve as an indicator.

Methods Also require development. Service statistics would be most appropriate. Special studies using "unknowns" - as with RAD - to evaluate their performance.

Details and Comments

As is the case with RAD, laboratory services are supportive and cannot easily be evaluated for effectiveness in terms of specific health status indicators. In addition, efficiency and effectiveness merge, and separate indicators are probably not feasible or desirable. At the PHC level, it would be premature to try to measure effectiveness inasmuch as the development of standard laboratory procedures that are appropriate is at an early stage.

A number of potential indicators can be considered, including the ratio of cases detected in peripheral laboratories to the estimated or known prevalence or disease reservoir, early detections vis-à-vis the numbers and types of hospitalizations, and reductions in the numbers of new cases detected. The timing of introduction of such indicators is critical if sound interpretations are to be made.

Inter-laboratory comparative studies of unknown substances, organized by LAB, follow the pattern described for RAD. This method is good for evaluation of referral laboratories but may not be suitable for use with peripheral laboratories without substantial modification.

HEALTH ISSUE: Development of Radiological Services  
SOURCE OF INFORMATION: DTR/RAD, Dr G. Souchkevitch

25 March 1986

<u>Indicators</u>	Quality control: no. of fields spoiled; no. of fields rejected; no. of investigation procedures repeated; no. of correct/incorrect identifications in "phantoms". Subjective evaluations of diagnostic, therapeutic, health outcome effects; economic implications and patient acceptance of procedures.
<u>Methods</u>	Self-administered questionnaires; special inter-laboratory comparison studies.

Details and Comments

Radiology, radiotherapy and nuclear medicine are support services and their effectiveness cannot be measured directly by health status indicators. Suitable indicators of effectiveness are also measures of efficiency, and the two cannot be readily distinguished.

Surveys of governments and laboratories belonging to the RAD collaborating centre network constitute the routine method of evaluation. Standard questionnaires that are self-administered are sent out periodically. An attempt is made to involve all laboratories in developing countries. Canvasses request information on equipment, staff and quality control measures as indicated above. In addition, RAD organizes special interlaboratory studies on quality performance of nuclear medicine imaging devices using phantoms of the liver, brain and thyroid gland, and of the quality of dosimetry in radiotherapy using thermo-luminescent dosimeters. Sealed "phantoms" are sent to laboratories for examination to locate shadows. Laboratories report findings on standard forms and are rated on the basis of different quantitative criteria, including true and false positive and negative findings. The results can be used to identify weaknesses and needs for additional training or retraining. Results also provide a basis for inferring the effect of radiological work on health care - especially when numerous false findings are reported. This method of evaluation is relatively simple, straightforward and inexpensive, and serves well for monitoring and evaluating the efficiency and effectiveness of radiation medicine facilities in developing countries.

For additional detail, see:

1. Proceedings of an International Symposium on Nuclear Medicine and Related Medical Applications of Nuclear Techniques in Developing Countries, organized by the International Atomic Energy Agency in cooperation with WHO, Vienna, August 1985.
2. EUR J Nucl Med (1985) 10: 193-197.
3. WHO/IAEA Interlaboratory Comparison Study of Nuclear Medicine Imaging Devices, (RAD/F/84.1), (RAD/F/84.2).
4. Brederhoff, J., Racoveanu, N.T. Radiological Services throughout the World, Diagnostic Imaging 51: 121-133 (1982).
5. Racoveanu, N. T. IAEA/WHO TLD Dose Intercomparison and the Need for a Quality Assurance Programme in Radiotherapy (abstract).
6. Racoveanu, N.T. The Radiographer's Role in Increasing the Efficiency of the Diagnostic Imaging Department. Radiography July/August 1984, Vol. 50 no. 592.

HEALTH ISSUE: Provision of Pharmaceuticals, and Vaccines  
SOURCE OF INFORMATION: DAP, Mr J. Hasfeldt

20 February 1986  
17 March 1986

Indicators: Availability of drugs  
Accessibility of drugs  
Proper use of drugs (compliance)  
Client satisfaction  
Community involvement.

Methods: Availability: stratified cluster sample surveys of health facilities,  
Accessibility: estimates of catchment population; one-day survey of sample of patients attending health facilities; comparison of health records with population distribution.  
Use: examination of facility records and practices.  
Satisfaction: survey of sample of patients at facilities; facility records.  
Community involvement: Questions in survey of facilities; interviews with community leaders.

#### Details and Comments

Mortality and disease incidence rates could be calculated from vital and service statistics, if those statistics were complete, or from specially collected data. However, such rates would have very limited value for the evaluation of programme effectiveness since it would be difficult or impossible to attribute changes in rates to Action Programme on Essential Drugs programmes as opposed to other interventions occurring at the same time. Therefore, DAP does not recommend use of health status indicators except in cases where vital and health service statistics are reasonably complete and, then only after a programme has been running for a long time.

Instead, DAP has adopted the five indicators listed above as appropriate for evaluating effectiveness in programmes newly begun and through the early stages of development. In a sense, the indicators are adapted to the stage of programme development.

During the early stages of programme development, DAP recommends the use of cluster sample community surveys and surveys of facilities. These will initially serve as diagnostic baseline surveys; follow-up surveys should be undertaken at intervals for evaluation. Survey methods and indicators are being pilot tested and will be further refined. Sample sizes are not fixed, but it is expected that a survey will require about three weeks in the field. In addition, sentinel areas are being considered for the evaluation of management and logistics. For the time being, there is substantial collaboration between DAP and MOHs in establishing baselines, both in technical and financial terms, but it is assumed that full responsibility for monitoring and evaluation will be taken over by MOHs as the drug programmes develop.

For additional information see Guidelines for Evaluating an Essential Drugs Programme (DAP/85.8 (1985)).

HEALTH ISSUE: Drug and Vaccine Standards

SOURCE OF INFORMATION: DTR/BLG, Dr V. Gratchev

8 April 1986

Indicators Standards of quality specific to each vaccine and biological drug.

Method Standardized laboratory tests.

Comments

BLG develops standards and distributes methods for evaluating drug/vaccine quality in collaboration with various other WHO programmes - such as EPI, TDR, SCH, HRP. BLG is concerned with production of these products rather than with end-use. Consequently, evaluation of national programme effectiveness cannot be carried out in terms of specific health status indicators. Mexico, Brazil, Cuba, Argentina and India are among the few such producers among the developing countries, in part because the production of some vaccines, such as rabies vaccine, is difficult and expensive. Producers in these countries are certified on the basis of independent retests of products arranged by BLG through WHO Collaborating Centre Laboratories.

Although BLG develops standards, it is the responsibility of governments to monitor product quality. BLG receives and assists in the development of national protocols for quality control. National laboratories evaluate production quality control by retesting samples from various batches of products. Measurement of effectiveness, therefore, would have to be based on laboratory data on samples retested.

For additional detail, see Biological Substances: International Standards, Reference Preparations and Reference Reagents, 1984 (WHO 1985).

HEALTH ISSUE: Planning, Management and Operation of Vector Biological Control Programmes

SOURCE OF INFORMATION: VBC/FMO, Dr R. Tomm

21 February 1986

Indicators See MAP, PDP, CDS, etc.

Methods See above.

Comments

VBC is essentially a service division to the programmes and divisions noted above, and indicators and methods used by them are ones developed for vector control or monitoring, and are thus recommended by VBC.

There is no lack of methodologies in this area but there are deficiencies in the use of information on indicators in decision making. Epidemiologists do not make sufficient use of the indicators.

In relation to the impact of programme activities on health, effective control of vectors and pests can be said to improve the quality of life. In fact, this is about the only justification for mosquito activities districts in developing countries. The socio-economic situation is also improved indirectly, but measurement of impact, vis-à-vis quality of life as well as the socio-economic situation, has always been difficult.

Sentinel areas are effective in the Caribbean for dengue surveillance. The better structured programmes collect information on cost-effectiveness, but again the information is under-utilized.

HEALTH ISSUE: Control of Vectors

SOURCE OF INFORMATION: VBC/ECV, Dr C. Pant and Dr R. Le Berre 4 March 1986  
24 March 1986

Indicators Vector densities and infection rates.  
Incidence, prevalence, morbidity and mortality rates for specific diseases.

Methods Standardized methods of sampling vectors; community sample surveys and surveillance (OCP); sentinel areas.

Details and Comments

Standardized methods exist for evaluating the entomological, medical, socioeconomic and environmental effectiveness of vector control operations. Where VBC has been directly involved, evaluation has been incorporated in activities covering selected areas. In the case of collaboration with OCP, full responsibility for evaluation rests with OCP/WHO and has proved to be fully satisfactory. This includes cost-effectiveness analyses being carried out by collaborating centres. Where VBC is not directly involved, and responsibility presumably rests with national authorities, it is believed that evaluations of effectiveness are carried out in selected areas only, mainly owing to the lack of resources, and national activities on vector control and research. Consequently, for developing countries, the issue is not one of indicators and methods for evaluation of effectiveness, but of their use.

For additional information see OCP publications on file.

HHEALTH ISSUE: Safe Use of Pesticides  
SOURCE OF INFORMATION: VBC/PDS, Dr J. Copplestone

6 March 1986

Indicators None currently suitable for use in developing countries.

Methods Poison control centre surveillance; ad hoc surveys.

Comments

As in the case of food safety and food poisoning, pesticide poisoning is difficult to measure in developing countries. In principle, one could evaluate effectiveness by incidence rates, but these are extremely difficult to obtain under the best of conditions. Routine reporting systems are probably useless for the purpose: surveys might not be feasible because of large samples and high costs involved, on the one hand, and the questionable utility of results, on the other. It has been estimated that there are approximately 1 million cases of accidental pesticide poisoning globally a year, and that pesticide poisoning accounts for 3-8% of all accidental poisoning. In most countries with active programmes for prevention of accidental poisoning, poison control centres collect information on cases and serve as the main source of estimates of trends in poisoning. Until such centres are well-established in developing countries, it may be argued that evaluation of programme effectiveness is virtually impossible, except by retrospective surveys of hospital admissions.

In the absence of "hard" measures of effectiveness of programmes aimed at preventing pesticide poisoning, the only suitable alternatives for evaluating programmes are on the basis of the existence of a programme and education campaigns, subjective evaluations of performance, increased awareness among the population, and similar criteria. These do not conform to the HFA Series definition for indicators of effectiveness, but indicators in this area of the sort prescribed by that book cannot be developed for developing countries.

HEALTH ISSUE: Research into Tropical Diseases  
SOURCE OF INFORMATION: TDR, Dr D. Rowe

27 February 1986

TDR develops new tools and methods to improve the control of major groups of tropical diseases - i.e., malaria, schistosomiasis, filariasis including onchocerciasis, trypanosomiasis, leishmaniasis and leprosy. New tools such as drugs, vaccines, diagnostic tests and vector control measures are under development. In addition, epidemiological and social and economic aspects are under study to improve strategies for disease control. All aspects of research and development are planned, implemented and evaluated by scientists working in Scientific Working Groups and their Steering Committees.

Through the Research Strengthening Group TDR seeks to enable scientists and institutions in developing countries to plan and execute research. Evaluation is carried out as an ongoing activity throughout the period of support by the TDR Secretariat and technical units of the WHO and by visiting scientists to the institutions.

The overall progress of TDR is reviewed annually by a group of highly experienced scientists constituting the Scientific and Technical Advisory Committee (STAC). STAC's report is considered by the Joint Coordinating Board, comprising representation of donor agencies, tropical countries and the sponsoring agencies.

HEALTH ISSUE: Research into Human Reproduction  
SOURCE OF INFORMATION: HRP, Dr A. Mundigo

20 February 1986

Indicators Numerous, including acceptance, continuation, prevalence, morbidity, mortality and fertility rates.

Methods Usually surveys, surveillance, censuses and/or service statistics in the context of an experimental research design, normally including a control area or group.

Details and Comments

This summary should be considered in conjunction with the one for TDR since the two programmes are similar in structure and objectives. Both are primarily concerned with research and development of methods, drugs and techniques rather than the provision of services. However, both programmes have task forces that deal with service, economic, social sciences and/or epidemiological aspects of the introduction and use of drugs, methods, etc. in national health programmes. These task forces promote and support field research to develop a better understanding of problems and needs in day-to-day health care systems. In the process, indicators and methods for measuring effectiveness of specific interventions are tested and refined. Many of these have become standard tools for evaluation. In recent years this has been especially important at the primary health care level. The methods and indicators used in field studies vary according to the objectives of each one, with the exception of multi-centre studies.

For additional information see the annual reports of HRP and the various task force inventories. The social science task force inventory is on file.

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