HEALTH SYSTEMS PERFORMANCE ASSESSMENT: DEBATES, NEW METHODS AND NEW EMPIRICISM

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Evidence and Information for Policy Cluster

World Health Organization

OUTLINE

- World Health Report 2000 (WHR 2000)
- Debates, Consultations and Peer Review
- New Methods and Empiricism
- Enhancing the Policy Relevance of HSPA

Overall HSPA Objectives

1) Monitor and evaluate attainment of critical outcomes and the efficiency of the health system in a way that allows comparison overtime and across systems
2) Build an evidence-base on the relationship between the design of the health system and performance.
3) Feed back into the policy debate - national & international
4) Empower the public with information relevant to their well-being

Boundaries of health systems

Key concept: health action

Criterion: activities whose primary intention is to improve health

SOCIAL GOALS AND SYSTEMS

SOCIAL GOALS	SOCIAL SYSTEMS					
	Education	Health	Economic	Political	Cultural	Other
Education						
Health						
Consumption						
Democratic participation						
Knowledge						
Other						
Responsiveness						
Fair financing						

HEALTH SYSTEM GOALS

	LEVEL	DISTRIBUTION
Health	✓	✓
Responsiveness	✓	✓
Fairness in Financial Contribution		✓
	Quality	Equity

Efficiency

Health Level - Healthy Life Expectancy (HALE - previously DALE)

- Constructed on life expectancy
- Includes non-fatal health outcomes
- Equals life expectancy in equivalent full health
- Calculated using data on epidemiology of major conditions and population health surveys
- health state valuations from GBD 1990

Males
Females

DALE (years)

85
75
65
55
45
35
25

30 35 40 45 50 55 60 65 70 75 80 85

Life expectancy (years)

Health Inequality: Population-Weighted Average E(0) by Group USA

90
85
80
75
70
65
60

Average E(0)

Female
Male
Avg M & F

1 2 3 4 5 6 7 8

America

Distribution of risk of death for children, Benin (5q0=153) and Central African Republic (5q0=157)

0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0

% population

0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1

Probability of child death

Benin
CAF

Health Inequalities WHR2000

$$II[\alpha, \beta] = \frac{\sum_{i=1}^{n} \sum_{j=1}^{n} \left| h_i - h_j \right|^{\alpha}}{2 n^2 \overline{h}^{\beta}}$$

h_i = *expected survival time for child* i,
n = *number of children in the population*
$\overline{h}$ = *average expected survival time for all children.*
alpha parameter shows aversion to inequality
beta parameter is preference for a relative versus absolute measure
alpha and beta parameters estimated from internet interviews of approximately 1,600 persons.

Health Inequality

- Estimated for child survival - to 2 years
- 50 DHS surveys
- covariates used to estimate child survival for other countries

Responsiveness - level and inequality

- Focus on measuring what happens when health system and person interact
- Differs from patient satisfaction
  - Reduces role of expectations
  - Measured using key informants

Components of Responsiveness 2000

- Respect for persons
  - Dignity
  - Confidentiality
  - Autonomy
- Client Orientation
  - Prompt attention
  - Access to social support networks
  - Quality of basic amenities
  - Choice of provider

Fairness in Financial Contribution

Holding constant the level and distribution of health and responsiveness, some ways of financing the health system are more fair than others.

Catastrophic Payments are Unfair

Most people agree that financing systems organized in such a way that households may have to pay a catastrophic share of disposable income (e.g. >50%) to improve or protect their health are unfair.

Construction of fairness of financial contribution (FFC)

$$HFC_i = \frac{HE_i}{ENSY_i}$$

- where ENSY = effective income minus subsistence expenditure (actual food)
- HE is all exp, including tax, insurance

Principle of Equal Sacrifice

- FFC perfectly fair if all households pay the same proportion of their non-subsistence income on health

Attainment and Performance

- Attainment = achievement of goals - singly and composite attainment. Weights from a web-based survey

- Performance (Efficiency) - attainment related to resources available and other non-health system inputs to the production of health system outcomes

- Separate efficiency (performance) index for health, and for the composite goal

Health system goal

efficiency = b/(b+c)

M

c

B

A

b

L

a

inputs

INPUTS: Total Health Expenditure by Per Capita Income

Total Health Expenditure (%GDP)

12

8

4

0

5

7.5

10

Logarithmic Scale of Per Capita GDP (I$)

EFFICIENCY INDEX

- Frontier production function - attainment a function of health expenditure per capita, average years of schooling
- Translog production function , fixed effects, 1990-1994

$$Y_{it} = \alpha_i + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 (X_{1it})^2 + \beta_4 (X_{2it})^2 + \beta_5 (X_{1it})(X_{2it}) + v$$

- Other determinants of efficiency in a second stage analysis

Figure 2.7 Overall health system performance (all attainments) relative to health expenditure per capita, 191 Member States, 1997

Overall performance (percentage)

100

50

0

10 100 1000 10 000

Health expenditure per capita, 1997 international dollars

Functions of health systems

Stewardship

Financing

Revenue collection

Fund pooling

Purchasing

Provision

Personal health services

Non-personal health services

Resource generation

Figure 5.2 Structure of health system financing and provision in four countries

Bangladesh (1996/97)

Revenue collection
Pooling
Purchasing
Provision

General taxation
Donors
Out-of-pocket
Other
Ministry of health
Other governmental
No pooling
Individual purchasing
Ministry of health
Private providers

Chile (1991–1997)

Revenue collection
Pooling
Purchasing
Provision

General taxation
Social insurance
Out-of-pocket
Public health insurance fund (FONASA)
Private insurance (ISAPREs)
No pooling
Individual purchasing
Other governmental
National health service
Private providers

OUTLINE

World Health Report 2000

Debates, Consultations and Peer Review

New Methods and Empiricism

Enhancing the Policy Relevance of HSPA

WHR 2000

- Widely debated by academics and government
- Demand from some governments to understand and apply
- Executive Board of WHO endorsed importance - said it should be repeated each 2 years
- Requested Peer Review of Methods to be used in the next round after wide consultation

Key General Debates

- Boundaries and accountability
- Causality
- Time
- Socially desirable goals and weights - composite index necessary?
- Practical policy links & intermediate indicators
- Total inequality or inequality linked to poverty
- Data Sources

BOUNDARIES and ACCOUNTABILITY

Personal medical services

Non-personal health services

COVERAGE

HEALTH

Intersectoral action

Other factors

Boundaries and Accountability

- Appropriate definition of health system - depends on concept of accountability
- if stewards of health system should ensure that health outcomes are the highest possible by:

  - personal, non-personal services, &
  - advocacy for interesctoral action ->

  broard definition appropritate

Causality

2 viewpoints

- Measure only those indicators MOH can influence which are known to change final outcomes - no. of children fully immunized; medical errors; OR
- Meaure final outcomes and drill down to causal factors

Timing

2 viewpoints on the definition of the maximum level of possible goal attainment

- Maximum possible for resources (health system and non-health system) available to MOH in this year
- Maximum possible for resources available if appropriate policies were followed now and in the past
- Intrinsically linked to accountability and boundaries

Goals and Weights 1

Are there other goals?

- In PAHO - caring; community participation.

  Captured in Responsiveness?

- FFC - Wall Street Journal?

- Others? E.g. Economic growth - does health make a large enough contribution to make it worthwhile measuring routinely?

Goals and Weights - 2

- **Weights for 2000 based on web survey - 50% health; 25% responsiveness, 25% fair financing - do they vary by country?**
- Empirical question

Policy Links and Intermediate Indicators

WHR 2000 criticised - measured inputs and final outcomes. For this to be practical to policy makers, need also:

- **stronger links to functions**
- **ability to "drill down" - identify key factors or indicators contributing to final outcomes**

Inequality

2 viewpoints

- total inequality important. Then disaggregate to see if poverty or socioeconomic status related to that inequality
- focus should be on inequality by socioeconomic status (sometimes other known disadvantaged groups)

Data Sources

WHR 2000: criticised for:

- not enough primary data with too much extrapolation
- lack of clarity on audit trail for some of the published figures

CONSULTATIVE PROCESS

- 6 Regional Consultations
- 8 Technical Consultations on Efficiency, Effective Coverage, Stewardship, Responsiveness, Cross-Population Comparability, Fairness in Financial Contribution, Health Inequalities, Summary Measures of Population Health
- 170 experts, 69 countries
- Scientific Peer Review Group
- Advisory Group

Scientific Peer Review Group

- Membership: Walid Ammar, Lebanon; Sudhir Anand, (Chair) India; Katarzyna Kissimova-Skarbek, Poland; Gregg Meyers, USA; Timothy Evans, Canada; Toshihiko Hasegawa, Japan; Ana Langer, Mexico; Adetokunbo O. Lucas, Nigeria; Lindiwe Makubalo, South Africa; Alireza Marandi, Iran; Andrew Podger, Australia; Peter Smith, United Kingdom; Suwit Wibulpolprasert, Thailand
- www.who.int/health-systems-performance

SPRG Key Recommendations 1

Supported:

- importance of HSPA
- boundaries and accountability - favoured the broad approach - encouraged stewardship
- the overall framework - inputs, functions and goals.

SPRG Key Recommendations 2

- **Causality**: supported the need to look at overall outcomes, but more work should be done on intermediate outcomes and on indicators directly under the control of MOH
- **Time**: a vexing problem, particularly for efficiency analysis. Efficiency important for HSPA, and recommended further development.

SPRG Key Recommendations 3

- **Goals**: supported those in framework (technical suggestions). Attempts to determine appropriate level of spending would be useful (OECD).
- **Goals weights**: empirical question. Test
- Inputs and outcomes important, but need to provide stronger links to **functions** - intermediate or process indicators that allow policy-makers to understand reasons for observed performance

SPRG Key Recommendations 4

- **Total vs. socioeconomic inequality**: Do both. Need strong emphasis on poverty. But also important to decompose inequality: are there other vulnerable groups?

SPRG Key Recommendations 5

DATA

- Need for increased data availability - strong support for World Health Survey, efforts to locate other micro data sources
- Provide data audit trail with transparent description of methods used for final figures
- Continue important development of techniques to ensure cross-population comparability of survey data

SPRG Key Recommendations 6

- Technical comments and recommendations on measurement and interpretation of inputs, functions, all outcomes
- www.who.int/health-systems-performance

SPRG: Strategic vs. Scientific Questions

- Strategic: composite attainment (efficiency)? Ranking?
- Executive Board Jan 2003 agreed that for the next round of Performance Assessment - no composite would be published and all data in alphabetical order by country
- Work on composites and weights (overall efficiency) to continue but not published the next round

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TECHNICAL RESPONSES

- Additional NHA breakdowns under development: pharmaceuticals
- Development of human resources work to complement health expenditures as inputs and resource generation function - migration
- Modifications of methods for developing health state valuations, fairness of financial contributions, responsiveness and for decomposing health inequalities.

This Workshop

- Session 2: Inequality

a. asset index and poverty

b. inequalities in health

c. inequalities in responsiveness

- Session 3: Service Provision - Effective Coverage of key interventions - methods and empiricism
- Session 4: Financing - goal and function

Data Availability: WHO Response

- 2000-2001 Multi-Country Household Survey Study on Health and Responsiveness - 71 surveys in 63 countries
- World Health Survey - 73 countries currently - modules on health, responsiveness, expenditure, risk factors, health state valuations etc.
- >94 household expenditure surveys from >70 countries for financing

Data Availability: Health Inequality

- DHS surveys > 65 countries
- data on child mortality experience of mothers from 15 countries in Pan Arab Project on Child Health
- vital registration data by small area from >30 countries
- individual level data linking deaths to census or health survey data

Data Audit & Transparency

- Executive Board January 2003 - all figures issued by WHO should be valid, reliable, comparable and with clear data audit trail
- Consultation on figures with countries before WHR publication
- Advisory groups to be established
- In addition to EIP Discussion Papers - >20 methods or results papers published in peer reviewed journals

Books

- Murray CJL, JA Salomon, CD Mathers, AD Lopez eds. *Summary measures of population health: concepts, ethics, measurement and applications*. Geneva, World Health Organization, 2002.
- Lopez AD, Ahmad O, Guillot M, Ferguson B, Salomon J, Murray CJL, K Hill. *World mortality in 2000: life tables for 191 countries*. Geneva, World Health Organization, 2002.
- "*Guide to producing national health accounts: with special applications for low-income and middle-income countries*" jointly with World Bank & USAID, World Health Organization 2003
- Murray CJL & DB Evans (eds). *Health systems performance assessment: debates, methods and empiricism.* WHO, 2003

Cross-Population Comparability

- SPRG agreed important to ensure data is comparable across populations as well as valid and reliable
- Differential item functioning

Response category cutpoint shift

A

E

S

Mo

Mi

N

B

E

S

Mo

Mi

N

C

E

S

Mo

Mi

N

Latent mobility scale

N = None, Mi = Mild, Mo = Moderate, S = Severe, E = Extreme

USA: NHANES III 1988-94 China: CPC/UNC Integrated Survey 1993

Evidence and Information for Policy

Proportion of Population $\geq$ 16, reporting bad & very bad health, ECHP 1994

United Kingdom
Portugual
Netherlands
Luxembourg
Italy
Ireland
France
Spain
Greece
Germany
Denmark
Belguim

Very Bad
Bad

0 5 10 15 20

% of total population sampled

Needs to Enhance Cross-Population Comparability

Same reliable and valid questions used in all populations

Establish the cutpoints for response categories in different populations and different sub-groups of individuals

Strategies to Enhance Cross-population Comparability

- Item Response Theory - hierarchical ordered probit (HOPIT), and compound HOPIT (CHOPIT)
- Calibration Tests
- Vignettes
- Special Session on Tuesday

Functions: WHO Response

- Defined indicators for all four functions
- Examples today on health service provision - coverage
- Health financing policy linked to the financing function
- Also available for stewardship and resource generation functions

FUNCTIONS THE SYSTEM PERFORMS

GOALS / OUTCOMES OF THE SYSTEM

Stewardship (oversight)

Creating resources (investment and training)

Delivering services (provision)

Financing (collecting, pooling and purchasing

Responsiveness (to people's non-medical expectations)

Health

Fair financial contribution

BOUNDARIES and ACCOUNTABILITY

Personal medical services

Non-personal health services

COVERAGE

HEALTH

Intersectoral action

Other factors

Fairness of Financial Contributions

- New data collection - described earlier
- Definition of the index - interpretable units
- Operations of the index denominator - total food expenditure inappropriate
- Measures in both income and burden spaces - what are the policy questions

HFC distribution measure in WHR 2000

$$FFC_0 = 1 - 4\frac{\sum \left| HFC_i - \overline{HFC} \right|^3}{0.125n}$$

The Revised FFC index

$$FFC = 1 - \sqrt[3]{\frac{\sum_{i=1}^{n} \left| HFC_i - HFC_0 \right|^3}{n}}$$

$$HFC_i = \frac{total_health_payments_i}{Non-subsistence_effective_income_i}$$

$$HFC_o = \frac{\sum total_health_payments_i}{\sum Non-subsistence_effective_income_i}$$

Household's capacity to pay

- Effective income net of subsistence spending
- Subsistence spending: Food share based poverty line
  - the average equivalized food expenditure of households whose food share of total household expenditure is within the 45th and 55th percentile

Income and Burden Spaces

Aspects	Income space	Burden space
Theoretical bases	Progressivity principle	Equal sacrifice principle
Distribution measure	Change of income distribution (RE)	Distribution of burden (FFC)
Threshold measure	The difference in headcount before and after health payments (DH)	Percentage of households with catastrophic health expenditure (CATA)
Policy concerns	Progressivity	Catastrophic expenditure Horizontal inequality and some element of progregressivity
Policy suggestion	Useful	Useful

Correlation coefficients between measures in the income and burden space

	Burden space		Income space	
	FFC	%CAT	RE	DH
FFC	1.000			
%CAT	-0.903	1.000		
RE	-0.071	0.028	1.000	
DH	-0.740	0.708	0.251	1.000

Catastrophic payment and impoverishment

VNM
BRA
COL
AZE
ARG
BGD
GHA
KHM
BGR
UKR
PRY
JAM
NIC
EGY
LBN
LVA
PER
LKA
SEN
PAN
KGZ
YEM
IDN
MAR
EST
ZMB
PRT
MEX
THA
MUS
LTU
NAM
USA
KOR
GRC

5
4
3
2
1
0

0
2
4
6
8
10

% of impoverish households

% of households with CATA

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- World Health Report 2000
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Sub-national performance assessment and monitoring

- Well established, widely publicised
  - UK, Canada, USA, Chile, Ghana, Indonesia (province level)…others
- Moving to establish
  - South Africa
  - Using WHO framework - Mexico, Uganda, Iran, Indonesia (district)

Mexico: Per capita public health expenditure by state

1,000
900
800
700
600
500
400
300
200
100
0

1999 2000

AGS BC BCS CAM COA COL CHIS CHIH DF DUR GTO GRO HID JAL MAX MICH MOR NAY NL OAX PUE QRO QROO SLP SIN SON TAB TAM TLAX VER YUC ZAC

Mexico: Healthy Life Expectancy at Birth

HALE (years)

Males	
Red	55.2 - 60.3
Yellow	60.4 - 61.4
Green	61.5 - 63.1

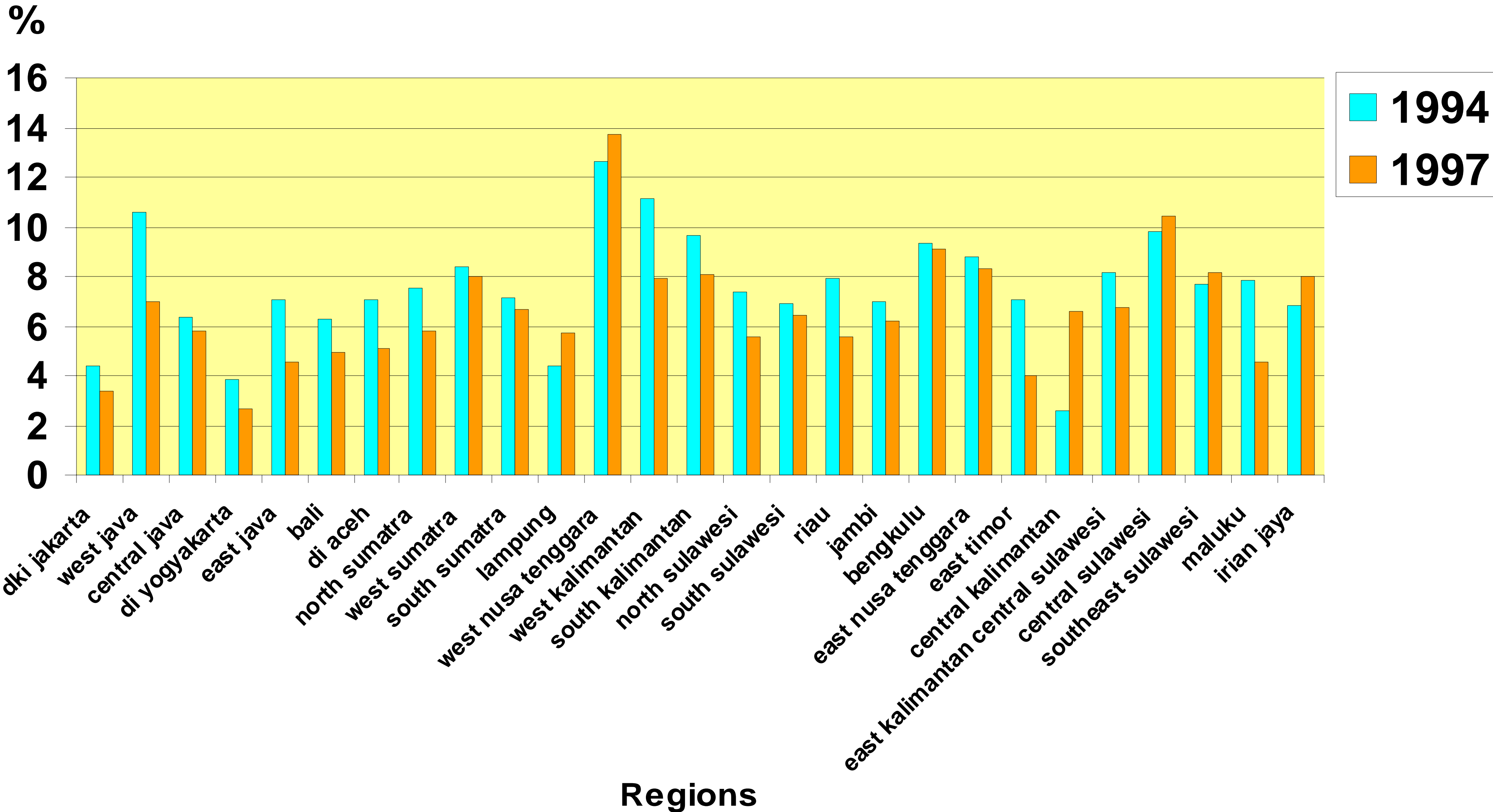
Females	
Red	61.0 - 65.4
Yellow	65.5 - 66.2
Green	66.3 - 67.3

Males

Females

I N D O N E S I A:

child mortality by province



Percentage of households with catastrophic health expenditures (Ghana)

proportion of households with cata.exp.

6.0%
5.0%
4.0%
3.0%
2.0%
1.0%
0.0%

LSMS
1999

Workshop Agenda

- Session 2: Inequality
- Session 3: Service Provision - Effective Coverage
- Session 4: Financing - goal and function