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Selecting Indicators for the Quality of Health Promotion, Prevention and Primary Care at the Health Systems Level in OECD Countries

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SELECTING INDICATORS FOR THE QUALITY OF HEALTH PROMOTION, PREVENTION AND PRIMARY CARE AT THE HEALTH SYSTEMS LEVEL IN OECD COUNTRIES

MARTIN MARSHALL, SHEILA LEATHERMAN, SOEREN MATTKE AND THE MEMBERS OF THE OECD HEALTH PROMOTION, PREVENTION AND PRIMARY CARE PANEL

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1. Martin Marshall, University of Manchester, United Kingdom and Sheila Leatherman, University of North Carolina, US, and the Judge Institute of Management of the University of Cambridge, UK, co-chaired the OECD Health Promotion, Prevention and Primary Care Panel. Soeren Mattke, OECD Secretariat, was convenor of the panel and co-authored this report. The remaining members of the OECD Primary Care and Prevention Panel and co-authors of this report with the co-chairs were: Niek Klazinga, University of Amsterdam, The Netherlands, Charlie Hardy, Department of Health and Children, Ireland, Eckart Bergmann, Robert Koch-Institute, Germany, Luis Pisco, Instituto da Qualidade em Saúde, Portugal, and Jan Mainz, National Indicator Project, Denmark. Brief biographies of the chair and Panel members can be found in Annex 2.

SUMMARY

1. This report presents the consensus recommendations of an international expert panel on indicators for health promotion and primary care. Using a structured review process, the panel selected a set of 27 indicators to cover the three key areas health promotion, preventive care and diagnosis and treatment in primary care. The report describes the review process and provides a detailed discussion of the scientific soundness and policy importance of the 27 indicators as follows:

Health Promotion	Obesity prevalence
	Physical activity
	Smoking rate
	Diabetes prevalence
	Gonorrhoea/Chlamydia rates
	Abortion rates
Preventive Care	Blood typing and antibody screening for prenatal patients
	HIV screen for prenatal patients
	Bacteriuria screen for prenatal patients
	Immunisable conditions
	Low birth weight rate
	Adolescent immunisation
	Anaemia screening for pregnant women
	Cervical gonorrhoea screening for pregnant women
	Hepatitis B screen for pregnant women
	Hepatitis B documentation in record at time of delivery
	Hepatitis B immunisation for high-risk groups
	Influenza vaccination for high-risk groups
	Pneumococcal vaccination for high-risk groups
Diagnosis and Treatment: Primary Care	Congestive Heart Failure readmission rate
	First visit in first trimester
	Smoking cessation counselling for asthmatics
	Blood pressure measurement
	Re-measurement of blood pressure for those with high
	Initial laboratory investigations for hypertension
	Hospitalisation for ambulatory care sensitive conditions

RESUME

2. Ce rapport présente les recommandations consensuelles d'un groupe d'experts internationaux sur les indicateurs relatifs aux soins primaires et à la prévention. En suivant une méthodologie détaillée, le groupe d'experts a sélectionné 27 indicateurs devant couvrir les trois grands domaines suivants : la promotion de la santé, la prévention, le diagnostic et le traitement dans les soins primaires. Le rapport décrit la méthodologie employée et démontre, arguments à l'appui, la viabilité scientifique et l'importance stratégique des 27 indicateurs suivants :

Promotion de la santé	Prévalence de l'obésité
	Activité physique
	Taux de tabagisme
	Prévalence du diabète
	Taux de gonorrhée/chlamydiae
	Taux d'avortements
Prévention	Détermination prénatale du groupe sanguin et des anticorps
	Dépistage prénatal du HIV
	Dépistage prénatal de la bactériurie
	Maladies vaccinables
	Taux de faible poids à la naissance
	Vaccination des adolescents
	Dépistage de l'anémie chez les femmes enceintes
	Dépistage de la gonorrhée chez les femmes enceintes
	Dépistage de l'hépatite B chez les femmes enceintes
	Inscription relative à l'hépatite B dans le dossier médical avant l'accouchement
	Vaccination contre l'hépatite B des groupes à risque
	Vaccination contre la grippe des groupes à risque
	Vaccination anti-pneumococcique des groupes à risque
Diagnostic et traitement/soins primaires	Taux d'hospitalisation pour insuffisance cardiaque congestive
	Première visite au premier trimestre
	Conseil d'arrêt du tabac aux asthmatiques
	Mesure de la tension artérielle
	Remesure de la tension artérielle en cas d'hypertension
	Premières analyses de laboratoire pour l'hypertension
	Hospitalisation des patients ambulatoires à risque

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INTRODUCTION

Background

3. This paper presents proposals for indicators of quality care in the area of health promotion, prevention and primary care. This is one of five areas, which have been identified by the OECD as having priority for the development of quality indicators (see Box 1). The Expert Group recommended identifying a shortlist of potential indicators for the six priority areas through panels of country experts and consultants in close collaboration with the Secretariat. Given resource constraints, this work was limited to reviewing existing indicators in Member countries rather than developing new indicators. It was further decided to consolidate the work on prevention/health promotion and primary care, as the boundaries between these areas seemed difficult to draw. This Technical Paper summarizes the proceedings and indicator recommendations of the consolidated Health Promotion, Prevention and Primary Care Panel. The first section describes the panel's methods of indicator selection and the second part the recommended indicators. The third section concludes with a discussion of the comprehensiveness and cohesiveness of the indicator set. A comprehensive discussion of all recommended indicators and short biographies of the Panel members can be found in Annex 1 and Annex 2, respectively.

Box 1. The OECD Quality Indicator Project

The technical quality of medical care, long regarded as a professional responsibility rather than a policy issue, now rivals cost and access as the foremost concern of health policymakers. A growing body of evidence suggests that the daily practice of care does not correspond to the standards that the medical profession itself puts forward. In addition, improving quality of care presents itself as an avenue to restraining the growth of medical expenditures by reducing costly complications and unnecessary procedures. In other words, better organisation and management of medical care would allow countries to spend their health care dollars more wisely. To improve care for their citizens and to realise these potential efficiency gains, policymakers are looking for methods to measure and benchmark the performance of their health care systems as a precondition for evidence-based health policy reforms. As published international health data sets such as OECD Health Data currently lack comparable measures for the technical quality of national health systems, there is, so far, little possibility of such international benchmarking. To fill this gap, the OECD Health Care Quality Indicators Project (HCQI) has brought together 21 countries,[2] the World Health Organization (WHO), the European Commission (EC), the World Bank, and leading research organisations, such as the International Society for Quality in Health Care (ISQua) and the European Society for Quality in Healthcare (ESQH). An expert group representing these countries and organisations has identified five priority areas for initial development of indicators: cardiac care, diabetes mellitus, mental health, patient safety, and prevention/health promotion together with primary care

Methods of Indicator Selection

Conceptual Approach

4. The main conceptual decision was to operationalise quality of care in the selected areas based on the function of a health care system rather than on service setting. In other words, the Panel sought to

2. The participating countries are Austria, Australia, Canada, Denmark, Finland, France, Germany, Iceland, Ireland, Italy, Japan, Mexico, The Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom and the United States.

identify indicators to capture the core components of care in each of the sectors, regardless of the institutional setting in which those components are provided. For example, certain preventive services like vaccination and screening may be delivered by dedicated government agencies in one country, by general practitioners in private practice in a second and by health plans in a third. In contrast to a conceptual approach that selects indicators by service settings or providers, this approach is cognisant of the diversity of health care delivery systems found in OECD countries and is still able to provide health policymakers with information how performance in their country compares to peers that have a very similarly or a very differently structured system.

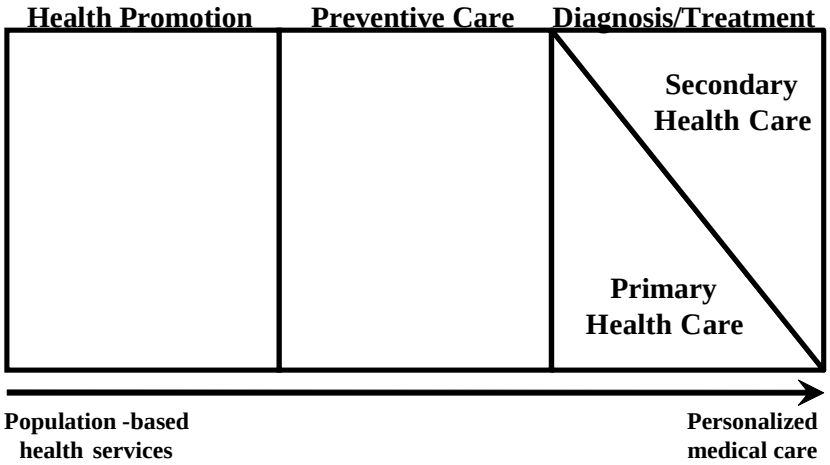
5. In the end, the Panel formed three categories to capture the core functions in selected areas in a health care system:

- Health promotion, *i.e.* the various population-based strategies that target major risk factors of disease, mostly through efforts to change health-related behaviour.[3]
- Preventive care, *i.e.* organised population-directed services in areas such as vaccination, screening and prenatal care.
- Primary health care, *i.e.* the subset of diagnostic and therapeutic activities considered as being the first line of organised personal medical care (in contrast to specialised medical care such as provided by medical specialists and in hospitals). Apart from general forms of diagnosis and treatment, the Panel regarded the coordination of care between different providers and the provision of guidance to patients through the health care system as key functions of primary health care.

6. Those three categories span the continuum of health care services in the areas of quality of care that this Panel was tasked to address (Figure 1). Along this continuum, the public good properties of a service diminish. As with all attempts to classify a continuum into categories, the definition of the boundaries may appear arbitrary.

[3] One issue to be addressed is whether the OECD health care quality indicators should focus exclusively on the technical quality of the health care delivery system - where health improvements may be expected to be significantly under the control of health care providers. In the area of health promotion, it is often difficult to gauge the impact of population-based interventions on health status because of the substantial influence of personal choice and socioeconomic factors on risk levels. For this reason, any proposed health promotion indicators should be distinguished clearly from those quality indicators which relate to the activities of health care providers.

Figure 1. Conceptual Model of the Continuum of Health Promotion, Prevention and Primary Care



7.

Results of the Indicator Selection Process

8. For the area of health promotion, prevention and primary care, the Secretariat compiled lists of existing quality indicators from the original work of the Commonwealth Fund Group, updates from sources that this group used, sources identified by the Secretariat and suggestions from Member countries and members of the Expert Group. Given the large number of indicators in these lists, the Panel started by eliminating duplicate indicators, removing indicators that would be considered by another Panel and indicators that would require medical record review, as it seemed unlikely that the necessary data could be made available. In addition, indicators that clearly addressed a narrowly defined aspect of quality were dropped, because those did not appear to be suitable for health system comparisons.

9. The previous steps resulted in a list of 109 potential indicators. Through a series of conference calls and email discussions, the Health Promotion, Prevention and Primary Care Panel converged on a final list of 27 indicators that are listed in Table 2 from 10 sources listed in Table 1. A detailed discussion of the importance and scientific soundness of all selected indicators can be found in Annex 1.

Box 2. Selection Criteria for Quality Indicators

Following the recommendations for indicator evaluation developed by the US Institutes of Medicine, the Expert Group and all expert panels agreed on the following three selection criteria for indicators (Hurtado, Swift, and Corrigan, 2001). First, it had to capture an important performance aspect. Second, it had to be scientifically sound. And third, it had to be potentially feasible.

The importance of an indicator can be further broken down into three dimensions:

Impact on health. What is the impact on health associated with this problem? Does the measure address areas in which there is a clear gap between the actual and potential levels of health?

Policy importance. Are policymakers and consumers concerned about this area?

Susceptibility to being influenced by the health care system. Can the health care system meaningfully address this aspect or problem? Does the health care system have an impact on the indicator independent of confounders like patient risk? Will changes in the indicator give information about the likely success or failure of policy changes?

The scientific soundness of each indicator can also be broken down into two dimensions:

Face validity. Does the measure make sense logically and clinically? The face validity of each indicator in this report is based on the basic clinical rationale for the indicator, and on past usage of the indicator in national or other quality reporting activities.

Content validity. Does the measure capture meaningful aspects of the quality of care?

The feasibility of an indicator reflects the following two dimensions:

Data availability. Are comparable data to construct an indicator available on the international level?

Reporting Burden. Does the value of the information contained in an indicator outweigh the cost of data collection and reporting?

As the panels were not able to make a definite statement about data availability for an indicator in all OECD countries, feasibility was given less weight in the decision process. The participating experts were asked to express their opinion as to whether it was likely, possible or unlikely to find comparable data on the international level for each indicator. If data availability was regarded as unlikely, an indicator was dropped, unless strong conceptual reasons existed to retain it.

All panels also agreed on the use of a modified Delphi process for quality measure selection developed by the RAND Corporation (Kerr et al., 2000) and further adapted by other investigators (Hermann, In press, b). Each panel member would rate each indicator individually on a scale from one to nine for the scientific soundness and importance dimensions,. The panel would then discuss the indicator, potentially ask its members to reconsider their original ratings and make a final decision. Scores from seven to nine reflected support of the indicator, scores between one and three rejection of the indicator and scores between four and six ambivalence towards an indicator. The Health Promotion, Prevention and Primary Care Panel decided to generally drop indicators with a median score <7.0 for either importance or scientific soundness. A few indicators with lower ratings were retained because panelists felt that the concept behind the indicator in question was important enough.

Discussion of the Cohesiveness and Comprehensiveness of the Proposed Indicator Set for the Areas of Health Promotion, Prevention and Primary Health Care

10. The work to include indicators in the three categories has so far been mainly inductive. The Panel identified a large list of existing indicators and went through a systematic process of evaluation and selection that is described in detail above. To facilitate the discussion of the large amount of indicators, the identified measures were divided into six groups (avoidable events, cardiovascular care, prevention, screening, diagnosis and treatment). The final set of 27 indicators is reasonably balanced between health promotion (6 indicators), preventive care (13 indicators, of which 7 address prenatal care) and primary care (8 indicators).

Health Promotion

11. The indicator subset for health promotion covers major areas of health-related behaviour that are typically targeted by health education and outreach campaigns, such as smoking rate, nutrition (obesity prevalence), physical activity and reproductive behaviour (Gonorrhoea/Chlamydia rates, abortion rates). In addition, diabetes prevalence was included in this subset to reflect the fact that the epidemic of diabetes has become a major policy concern. As evidence begins to mount that it is possible to prevent diabetes through a healthier life-style, the Panel felt that a measure of the cumulative success of the various interventions should be included. One aspect of health promotion that remains unaddressed is substance abuse, for which no suitable indicators were identified.

Preventive Care

12. In the subset for preventive care, indicators related to prenatal care are well represented (blood typing and antibody screening for prenatal patients, HIV screen for prenatal patients, bacteriuria screen for prenatal patients, low birth rate, anaemia screening for pregnant women, cervical gonorrhoea screening for pregnant women, hepatitis B screening for pregnant women). The remaining six indicators all relate to vaccination (immunisable conditions, adolescent immunisation, hepatitis B documentation in record at time of delivery, hepatitis B immunisation for high-risk groups, influenza vaccine for high-risk groups, pneumococcal vaccination for high-risk groups). This restriction to two aspects of the large field of preventive care is partly a consequence the selection process. Indicators related to secondary prevention of cardiovascular disease and diabetes have been evaluated by the respective Panels in those disease areas. Some indicators related to cancer screening are already under consideration by the OECD HCQI Project,

as the Expert Group had recommended cervical cancer screening and mammography screening to be included in the initial indicator list for the project. Nevertheless, additional indicators for screening for colon cancer, prostate cancer and melanoma of the skin appear necessary.

Primary Health care

13. The indicators selected for primary health care comprise treatment activities related to risk reduction by hypertension detection and management, smoking cessation counselling for asthmatics, blood pressure measurement, re-measurement of blood pressure for those with high blood pressure, initial laboratory investigations for hypertension and so-called avoidable events (hospitalisation for ambulatory care sensitive conditions, congestive heart failure readmission rate). While the recommended process indicators for risk-factor management seem sound and relevant, it would be preferable to complement them with indicators that reflect the success of those interventions in intermediate outcomes (*e.g.*, blood pressure control) as well. The avoidable events indicators capture problems in the delivery of primary care by looking at potentially unnecessary hospital admissions for conditions that are usually best managed on an outpatient basis. The first indicator (hospitalisation for ambulatory-care sensitive conditions) is a composite for common chronic conditions, such as hypertension, diabetes and various mental health diagnoses. The measure on readmission for congestive heart failure (congestive heart failure readmission rate) is indicative of the interaction and coordination between hospital care and primary health care for a chronic condition that is of increasing relevance in OECD countries. A composite indicator for avoidable hospitalisation for acute conditions, such as infections and dehydration, was not available but should be constructed in the future.

14. The Panel realises that the proposed set of indicators cannot be regarded as a comprehensive description of the quality of primary health care, rendering this category the least comprehensively covered of the three. Important areas that constitute a major part of primary care, such as degenerative and inflammatory musculoskeletal disease, COPD (Chronic Obstructive Pulmonary Disease), gastrointestinal disease, renal disorders and pain management, are not included. The challenge was that quality of care in those areas is best measured by process measures that indicate to what degree care is practiced in accordance with current medical knowledge, but such measures tend to require clinical data and thus dedicated data collections. Outcomes measures can usually be constructed from administrative data. But given the complexity of those diseases and the variety of health care providers involved in their care, it seems very difficult to construct outcomes indicators, for which the primary care system alone can reasonably be held accountable. In the initial survey of existing indicators, a multitude of process measures in primary health was identified, but most came from managerial applications that aimed at assessing differences between individual providers in great detail. The Panel felt that none of those indicators captured a process relevant enough to recommend dedicated data collection on the international level. Additional work will be necessary to identify and operationalise those critical processes of primary health care, which are of impact to health outcomes significant enough to justify the cost of collecting data. Those processes should be used to provide a balanced picture of the performance of the primary care system as part of the overall health care system.

Summative assessment and next steps

15. The Panel considers the suggested list of indicators an important step towards the definition of a comprehensive and cohesive set of performance measures for health promotion, preventive care and primary care. In particular when viewed in the context of prior work under the OECD HCQI Project and of the other Panels, a large part of this very broad area has been covered. The resource constraints under which the Panel had to operate implied that no in-depth conceptual discussion and no development of additional indicators were possible. Nevertheless, the Panel identified a preliminary set of 27 indicators with sufficient policy relevance and scientific soundness to consider them for international data collection. The Panel has been very cognisant of the fact that the burden of reporting requirements should be kept to

the necessary minimum to assure compliance and continuity in future. It has therefore largely ruled out any indicators that would require dedicated data collection. Thus, the selected set has a reasonable chance of being operationally feasible for a sufficiently large sample of OECD countries.

16. Obviously, the operational feasibility of the proposed indicators will now have to be assessed by a survey of data availability in OECD countries. Further study may be required to assure that those measures, which have typically derived from systems for provider comparisons and national target setting, are suitable for international benchmarking of health care systems. Prior to implementation, synergy with other international comparative data collection activities should be sought such as the programmes of the EU and WHO.

17. In addition, further development of indicators, beyond the gaps indicated above, should be considered. Most importantly, the focus of all three domains has been medical care. This is partly a consequence of the deliberate restriction of the work under this project to technical quality of care, partly it is inherent in the content of the available sets of indicators in various countries. However, the Panel is aware that other functions of health care systems, such as hospice care and social care, overlap and interact with primary care, yet are not covered by the present set. Finally, the focus has been on the potential contributions of physicians to quality and other professionals such as dentists and allied health professionals have not been specifically addressed.

Table 1. Indicator Sources

Set Name	Description
NCHS-Health, United States 2002	These measures are collected by the National Center for Health Statistics and were presented in "US Health, United States, 2002" the 26th report on the health status of the US, submitted by the Secretary of the Department of Health and Human Services to the President and Congress of the United States. This report was compiled by the National Center for Health Statistics (NCHS), Centers for Disease Control and Prevention (CDC). The National Committee on Vital and Health Statistics served in a review capacity.
UK DH	This indicator was developed set by the United Kingdom Department of Health
AMA Prenatal	These measures were developed by the American Medical Association Physician Consortium for Performance Improvement, a physician-led initiative including methodological and clinical experts. The measures are derived from established clinical recommendations where available and are intended to facilitate individual quality improvement.
AHRQ/HCUP refinement	This measure set was developed by refinement and further development of the US Agency for Healthcare Research and Quality's HCUP indicators. This process involved identifying indicators reported in the literature and in use by health care organisations, evaluating both the HCUP QIs and other indicators using literature reviews and empirical methods, and incorporating risk adjustment. These measures are all derived from routine hospital administrative data.
Avoidable Hospitalisations	This measure set was developed by Department of Health Care Policy faculty at Harvard Medical School. It monitors access and quality of care by calculating avoidable hospitalisation rates from computerised hospital discharge data. The set includes criteria for 12 avoidable hospital conditions.
CIHI Primary Care	This measure set was developed by the Canadian Institute for Health Information to measure the quality of primary care. These indicators all use existing Canadian data sources: a provider survey and hospital discharge records.
HEDIS 3.0 Hybrid	This measure set was developed by the Performance Assessment Committee of the National Committee for Quality Assurance. Its purpose is to systematise performance measures so that employers and others can evaluate health plans. This set includes specific indicators for the process of care within five major performance areas: quality, access and patient satisfaction, membership and utilisation, finance, and plan management. The fourteen quality indicators included here use both medical records and administrative data.
NPCRDC Project	This measure set was developed by the National Primary Care Research and Development Centre Primary Care Quality Indicator Project, UK It was developed using a modification of the RAND/UCLA appropriateness method, combining high quality scientific evidence with expert clinical consensus.
RAND Prenatal Care	This measure set was developed by the RAND Corporation. Forty-eight criteria for the quality of processes of prenatal care were developed from evidence from studies and expert opinion. Data are obtained from abstraction of inpatient and outpatient medical records. The 48 criteria in this set are grouped into three scales that measure adherence to the use of seven routine laboratory tests, to use of five specific first- and second-trimester processes, and to all other process criteria.

Table 2. Summary table of recommended set

Area	Indicator Name	Numerator	Denominator
Health Promotion			
	Obesity prevalence	People with a body mass index greater than or equal to 30.	Total population.
	Physical activity	Number reporting engaging in leisure-time physical activity.	Total population.
	Smoking rate	Number of smokers.	Total population.
	Diabetes prevalence	People with diabetes.	Total population.
	Gonorrhoea/Chlamydia rates	Cases diagnosed with Chlamydia or Gonorrhoea infections.	Total population.
	Abortion rates	Number of abortions.	Female population between 15 and 40 years of age.
Preventive Care			
	Blood typing and antibody screening for prenatal patients	Number of prenatal patients who have a determination of blood group (ABO) and D (Rh) type and antibody screening by the second prenatal care visit.	All Prenatal patients.
	HIV screen for prenatal patients	Number of patients who are screened for HIV infection during the first or second prenatal care visit.	Prenatal care patients, excluding those with documented refusal or HIV positive.
	Bacteriuria screen for prenatal patients	Number of patients who have at least one test to screen for asymptomatic bacteriuria.	All prenatal patients.
	Immunisable conditions	Patients under age 65 years who were admitted to the hospital during the reporting year with a primary diagnosis of an immunisable condition.	The number of residents in a state under age 65 years during the reporting year.
	Low birth weight rate	Number of births with ICD-9 diagnosis code for less birth weight than 2500 grams in any field. Patients transferring from another institution are excluded.	All births (discharges in MDC 15 - newborns and other neonates).
	Adolescent immunisation	The subset of the denominator who received a second dose of MMR by age 13 or who had a seropositive test result for measles, mumps or rubella by their 13th birthday.	A random sample of 411 enrolled adolescents whose 13th birthday was in the reporting year, who were members of the health plan as of their 13th birthday, who were continuously enrolled for 12 months immediately preceding their 13th birthday and who were not contraindicated for MMR.
	Anaemia screening for pregnant women	Anaemia screening at first prenatal visit.	All live births.
	Cervical gonorrhoea screening for pregnant women	Cervical gonorrhoea culture conducted at first prenatal visit.	All live births.

Area	Indicator Name	Numerator	Denominator
	Hepatitis B screen for pregnant women	Hepatitis B screen before delivery.	All live births
	Hepatitis B documentation in record at time of delivery	Carrier status documented on the delivery record.	Pregnant women carrying the Hepatitis B surface antigen.
	Hepatitis B immunisation for high-risk groups	Number offered three doses of HBV within 1 year.	(1) babies of mothers who are chronic carriers of hepatitis B, (2) babies who have had acute hepatitis B during pregnancy, (3) parenteral drug misusers, (4) haemophiliacs or those receiving regular blood products, (5) patients with chronic renal failure on dialysis.
	Influenza vaccination for high-risk groups	Number offered an annual influenza vaccination.	(1) Patients with chronic respiratory diseases, (2) patients with chronic heart disease, (3) patients with chronic renal failure, (4) patients with diabetes, (5) patients with immunosuppression of any cause, (6) residents of nursing and residential homes, (7) anyone aged over 75.
	Pneumococcal vaccination for high-risk groups	Number receiving pneumococcal vaccination.	Patients with (1) asplenia or severe splenic dysfunction, (2) chronic respiratory disease, (3) chronic heart disease, (4) chronic renal failure or nephrotic syndrome, (5) immunosuppression of any cause, (6) chronic liver disease, (7) diabetes.
Diagnosis and Treatment: Primary Care			
	Congestive Heart Failure readmission rate	Number of inpatient CHF hospitalisations with a readmission within 28 days, age 15-84. Exclude LOS < 3 days and readmission for CABG, PTCA, angioplasty, or pacemaker insertion. Exclude cancer, HIV and trauma cases.	Total number of CHF episodes in an 11-month period.
	First visit in first trimester	First prenatal visit in the first trimester.	All live births.
	Smoking cessation counselling for asthmatics	Number who have been advised on how to stop smoking using a combination of advice and support from a health professional.	Patients with asthma who are smokers.
	Blood pressure measurement	Number with blood pressure measured within the past five years.	Adults over the age of 25.
	Re-measurement of blood pressure for those with high blood pressure	Number with blood pressure re-measured within three months.	Patients with a blood pressure of 160/100 or higher.

Area	Indicator Name	Numerator	Denominator
	Initial laboratory investigations for hypertension	Number with the following tests within 3 months of diagnosis: (1) urine strip test for protein, (2) serum creatinine and electrolytes, (3) blood glucose, (4) serum/total cholesterol, (5) ECG.	Patients diagnosed with hypertension.
	Hospitalisation for ambulatory-care sensitive conditions	Total number of hospital admissions for ambulatory-care sensitive conditions: diabetes mellitus, alcoholic psychoses, drug psychoses, neurotic disorders, alcoholic dependence syndrome, drug dependence, nondependent abuse of drugs, depressive disorder not elsewhere classified, essential hypertension, hypertensive heart disease, hypertensive renal disease, hypertensive heart and renal disease, secondary hypertension and asthma.	Total mid-year population.

ANNEX 1: DETAILED DISCUSSION OF THE RECOMMENDED INDICATORS

Health Promotion

Obesity Prevalence

Operational definition

18. **Source:** NCHS-Health, United States 2002.

Numerator: People with a Body Mass Index (BMI) greater than or equal to 30.

Denominator: Total population.

Importance of the indicator

19. Clinical significance of process or outcome: Obesity substantially raises the risk of hypertension, dyslipidemia, type 2 diabetes, coronary heart disease, stroke, gallbladder disease, osteoarthritis, sleep apnoea, respiratory problems and endometrial, breast, prostate and colon cancer. Being overweight or obese is also associated with increased overall mortality.

20. Policy importance: The number of overweight and obese individuals has increased dramatically in the past decades. In the US, for example, 54.9% of adults over age 20 are overweight or obese. As a major contributor to avoidable mortality and a costly preventable condition, obesity is of primary public health concern. The total costs attributable to obesity-related disease approach $100 billion annually in the United States.

21. Susceptibility to being influenced by the health system: A combination of public educational campaigns, an efficient system of primary care and effective counselling can all improve the monitoring and management of obesity.

Scientific soundness of the indicator

22. Face validity: The BMI is typically used to determine and quantify obesity and also to assess the effect of weight loss interventions.

23. Content validity: Obesity is clearly linked to increased morbidity and mortality. Strong evidence shows that weight loss in obese individuals reduces risk factors for cardiovascular disease and diabetes. Weight loss leads to the lowering of blood pressure in hypertensive and non-hypertensive individuals, reduces serum triglycerides and increases HDL-cholesterol. Weight loss has also been shown to reduce blood glucose levels. There is evidence showing that dietary therapy, lower-calorie and lower-fat diets, increasing physical activity, behavioural therapy and other clinical approaches are effective weight loss techniques (NIH/NHLBI, 1998).

Physical activity

Operational definition

24. **Source:** NCHS-Health, United States 2002.

Numerator: Number reporting engaging in leisure-time physical activity.

Denominator: Total population.

Importance of the indicator

25. Policy Importance: Lack of physical activity is a risk factor for cardiovascular disease; the principal cause of mortality and morbidity in developed countries. Physical activity may combat the growing obesity epidemic in OECD countries.

26. Susceptibility to being influenced by the health care system: This area is not easily susceptible to influence by the health care system internally; a multi-disciplinary, society wide approach is needed to address this area. The growing availability of health impact-assessment methods, and policymaker interest in the implementation of such measures, offers the health system ways to deal with problems in this area.

Scientific soundness of the indicator

27. Face validity: Whilst there are some questions arising about the confining of the measure to leisure activity, this is seen as increasingly valid given the general reduction in physical activity at work, a trend which is probably more pronounced in OECD Member countries.

28. Content validity: Physical activity has been demonstrated to have protective effects for several chronic diseases – including coronary heart disease, hypertension, non-insulin-dependent diabetes mellitus, osteoporosis, colon cancer, and depression and anxiety. On average, physically active people outlive those who are inactive (Pate *et al.*, 1995; Paffenbarger *et al.*, 1986).

Smoking Rate

Operational definition

29. **Source:** NCHS-Health, United States 2002.

Numerator: Number of smokers.

Denominator: Total population.

Importance of the indicator

30. Clinical significance of process or outcome: Process and outcome consideration at a purely clinical level is difficult to access. This is an area where information science might have more of a role as with the indicator relating to obesity in particular, and the same comments apply here as to the obesity indicator.

31. Policy importance: Smoking is acknowledged as one of the highest, if not the highest, preventable causes of death across OECD Member countries – with upwards of one in five deaths directly attributable to smoking, and in addition massive morbidity problems, particularly in CVD respiratory and general disability arising. The US Center for Disease Control clearly states that smoking is the leading preventable cause of death in the US and to quote their website "Cigarette smoking is the single most preventable cause of disease and death in the United States. Smoking results in more deaths each year in the United States than AIDS, alcohol, cocaine, heroin, homicide, suicide, motor vehicle crashes and fires – combined. Tobacco-related deaths number more than 430 000 per year among US adults, representing more than 5 million years of potential life lost. Direct medical costs attributable to smoking total at least $50 billion per year".

32. Susceptibility to being influenced by the health care system: Traditionally, reducing smoking rates had been the domain of classical public health interventions, through educational campaigns, restriction of access to tobacco products and taxation. More recently, the problem has also been successfully addressed by medical interventions, such as cessation counselling and drug treatment.

Scientific soundness of the indicator

33. Face validity: The crucial need to address smoking dominates any consideration of face validity, and whilst it is difficult to clearly attribute cause and effect given the numerous factors interplaying in relation to decisions to smoke or cease smoking, measurement of smoking rate is the most accessible way to indicate trends in society where the quality of the approach in primary care can be investigated, if studied in conjunction with relevant policy and legal initiatives.

34. Content validity: Definitional work by WHO EUROHIS and US sources such as CDC amongst many others, given the importance attached to this area, show that effective content validity can be achieved for this indicator. It needs to be completely clear if the indicator is dealing with cigarette smoking or all smoking of tobacco products.

Diabetes Prevalence

Operational definition

35. **Source:** Committee suggestion.

Numerator: People with diabetes.

Denominator: Total population.

Importance of the indicator

36. Policy importance: The growing prevalence of diabetes and increasing evidence that Type II diabetes can be prevented by changes in diet and physical activity make this indicator very important to assess the impact of behavioural interventions.

37. Susceptibility to being influenced by the health care system: Better nutrition and increased physical activity has been shown to improve not only the prognosis of diabetics but also to reduce the risk of developing diabetes. Appropriate behavioural interventions through public health measures and the primary care system may thus reduce the burden of this grave disease.

Scientific soundness of the indicator

38. Face validity: The level of concern about the epidemic of diabetes and the possibility of preventing diabetes lend this indicator great face validity.

39. Content validity has some problems in relation to the levels of identification. This gives rise to the difficult situation in that high prevalence may well mean better identification therefore better outcomes in many situations. The interactions between preventative efforts and identification may lead to problems. Also, the national criteria for the diagnosis of diabetes need to be harmonised to allow for international comparisons.

Gonorrhoea/Chlamydia rates

Operational definition

40. **Source:** UK DH.

Numerator: Cases diagnosed with Chlamydia or gonorrhoea infections

Denominator: Total population

Importance of the indicator

41. Policy importance: Tracking the incidence of sexually transmitted diseases (STDs) remains of great interest to clinicians and policymakers. While gonorrhoea and chlamydia infections are easily treatable, changes in their incidence provide information about risky sexual behaviours such as unprotected intercourse. STD rates can also serve as a proxy to estimate risk for HIV transmission in the population.

42. Susceptibility to being influenced by the health care system: Better education about the risk of STDs and about ways to reduce that risk (*e.g.,* condom use) are known to be very effective in reducing transmission of those diseases.

Scientific soundness of the indicator

43. Face validity: Many countries have long tracked STD rates on the regional and national level, highlighting the importance that public health officials attach to them.

44. Content validity: Depending on societal attitudes and the regulatory environment, reported rates may not be comparable internationally. In countries where STDs are highly stigmatised, there may be under-reporting. Reporting requirements may vary across countries, some countries may have mandatory reporting, whereas others may have voluntary data collection.

Abortion Rates

Operational definition

45. **Source:** UK DH.[4]

Numerator: Number of abortions.

Denominator: Female population between 15 and 40 years of age.

Importance of the indicator

46. Policy importance: In spite of early school-based sexual education and wide availability of effective contraceptives in OECD countries, the vast majority of abortions are still performed for unwanted pregnancies rather than for genetic indications or to terminate a pregnancy in a rape victim. An abortion may have substantial long-term consequences in women, both psychologically and medically.

47. Susceptibility to being influenced by the health system: Both public health measures, such as educational campaigns and medical services, such as risk assessment, counselling and provision of contraceptives, can reduce unwanted pregnancies and abortions.

Scientific soundness of the indicator

48. Face validity: The potential medical risk and psychological burden of abortions make it a legitimate goal for the health care system to reduce them. However, it may be difficult to identify the specific contribution of the health care system, as abortion rates are multifactorially determined. Other policies, such as those regarding childcare and support of single mothers, as well as societal attitudes, will influence this indicator.

49. Content validity: Depending on the legal and political situation, abortion rates may be under-reported in some countries.

Preventive Care

Blood Typing and Antibody Screening for Prenatal Patients

Operational definition

50. **Source:** AMA Prenatal.

Numerator: Number of prenatal patients who have a determination of blood group (ABO) and D (Rh) type and antibody screening by the second prenatal care visit.

Denominator: All prenatal patients.

51. Data requirements*:* Numerator: list of patients with evidence of blood typing and antibody screening by second prenatal visit. Denominator: list of all prenatal patients.

4. This indicator was suggested by the United Kingdom Department of Health (CCHI, 2001). It has not yet been adopted for national use in the UK

Importance of the indicator

52. Prenatal ABO blood typing is conducted routinely in case a blood transfusion is required during intrapartum care. Rhesus typing and autoantibody testing is also conducted as a screening procedure to prevent rhesus iso-immunisation. This condition, which can cause foetal complications such as haemolytic anaemia, hyperbilirubinaemia, hydrops foetalis and foetal death, used to be common but has declined dramatically in prevalence since the introduction of rhesus immunisation (now 14.3 of every 100 000 pregnancies affected in the US). Approximately 10% of women are rhesus negative and up to 15% of these become auto-immunised postpartum without prophylaxis. There is good evidence that prepartum immunisation with anti-D prevents iso-immunisation. The use of anti-D in patients with threatened abortion of antenatal miscarriage is uncertain and there is some debate about whether to only test for antibodies in women at high risk of auto-immunisation. However, most guidelines recommend routine testing of all prenatal women at 24-28 weeks gestation. Identification of process/outcome as quality problem: Whilst the rate of rhesus disease is now low, preventable cases still occur.

53. Policy importance: The low incidence of rhesus disease is dependent upon maintaining current screening procedures.

54. Susceptibility to being influenced by the health system*:* Blood typing and auto-antibody screening are simple procedures that can be carried out within any health system.

Scientific soundness of the indicator

55. Face validity: Blood typing and auto-antibody screening are accepted practices, recommended by professional bodies and have a high level of face validity amongst health professionals.

56. Content validity: As a simple screening procedure, the content validity of blood typing and antibody screening in prenatal patients is high.

57. Evidence supporting indicator validity: Whilst there is no evidence from randomised controlled trials of the effectiveness of rhesus immunisation, there is observational evidence that screening and immunisation programmes have reduced the incidence of rhesus disease (McGlynn *et al.*, 2000).

Operational issues

58. Availability of interpretative data: Benchmarking data about the prevalence of rhesus disease is available in most countries.

HIV Screening for Prenatal Patients

Operational definition

59. **Source:** AMA Prenatal.

Numerator: Number of patients who are screened for HIV infection during the first or second prenatal care visit.

Denominator: Prenatal patients excluding those with documented refusal or those who are HIV positive.

60. Data requirements: Numerator: written record of whether prenatal patients have been screened for HIV infection. Denominator: list of all prenatal patients excluding those with documented refusal for test or those who are known to be HIV positive.

Importance of the indicator

61. Clinical significance of process or outcome: A woman carrying the HIV virus has an estimated 30% risk of transmitting it to her foetus. Congenital HIV infection has a rising incidence and a poor prognosis. Routine screening can help mothers to make informed choices about the continuation of their pregnancy. In addition, there is mounting evidence from randomised controlled trials that antiviral therapy during pregnancy can reduce the incidence of viral transmission to the baby (McGlynn *et al.*, 2000). As a result, more countries are recommending routine availability of HIV testing early in pregnancy (AMA, 2001).

62. Identification of process/outcome as quality problem: It is unclear whether reliable audit data exists for this indicator.

63. Policy importance: HIV infection is a major international issue with significant social and economic consequences. Prenatal care offers one opportunity to reduce the prevalence of the infection in the population. Susceptibility to being influenced by the health system is high.

Scientific soundness of the indicator

64. Face validity: Since this is a relatively new recommendation, the awareness and acceptability of this indicator is still developing. The rigorous scientific evidence of the effectiveness of antiviral treatment to reduce neonatal infection will help to improve its face validity.

65. Content validity: As a simple screening procedure, the content validity is high.

66. Evidence supporting indicator validity: As described above, the indicator is supported by evidence from randomised trials.

Bacteriuria Screening for Prenatal Patients

Operational definition

67. **Source:** AMA Prenatal.

Numerator: Number of pregnant patients who have at least one test to screen for asymptomatic bacteruria.

Denominator: All prenatal patients.

68. Data requirements: Numerator: recorded result of mid-stream urine sample from prenatal patients. Denominator: list of all prenatal patients.

Importance of the indicator

69. Clinical significance of process or outcome: Asymptomatic bacteruria occurs in up to 10% of pregnancies and up to 40% of these will later develop a symptomatic urinary tract infection (McGlynn *et al.*, 2000). This may result in preterm labour and maternal pyelonephritis. Experimental and meta-analytical evidence from studies conducted in the US and the UK have demonstrated that treatment of asymptomatic infection in pregnant women can halve the relative risk of low birth weight and preterm labour (McGlynn *et al.*, 2000; Marshall *et al.*, 2002). Urine culture of a mid-stream specimen offers the best balance between sensitivity and specificity in comparison with urine dipstick testing. The cost effectiveness and frequency of urine testing are both uncertain.

70. Identification of process/outcome as quality problem: It is unclear whether reliable audit data exists about the current frequency of testing for asymptomatic bacteriuria.

71. Policy importance: Pyelonephritis and preterm labour both have significant health and economic implications for developed health systems.

72. Susceptibility to being influenced by the health system: The conduct of this simple screening test is within the control of health systems.

Scientific soundness of the indicator

73. Face validity: Whilst the evidence of the incidence of asymptomatic bacteriuria and its implications is convincing, routine testing for all prenatal patients is only slowly becoming routine practice. The lack of evidence of cost-effectiveness and uncertain timing and frequency of testing also reduce the face validity of this indicator.

74. Content validity: As a simple screening procedure, the content validity is high.

75. Evidence supporting indicator validity: Whilst there is experimental evidence of the benefits of treating asymptomatic urine infections in pregnant patients, the indicator itself is based on professional consensus.

Immunisable Conditions

76. **Source:** Avoidable Hospitalisations.

Numerator: Patients under age 65 years who were admitted to the hospital during the reporting year with a primary diagnosis of an immunisable condition.

Denominator: The number of residents under age 65 years during the reporting year.

Importance of the indicator

77. Any disease in which a vaccine is available should technically be non-existent. Although vaccines are made readily available through public health units and other providers, and are mandated via the school system, cases inevitably appear. Those diseases or hospitalisations that are preventable or avoidable if timely primary care or preventive services are offered are defined as sentinel events. This category of indicators should serve as a warning to communities that a problem may exist with access to or quality of primary care being offered to its residents.

Scientific soundness of the indicator

78. Avoidable hospitalisations are those conditions that could have been avoided if proper ambulatory care had been received (Weissman *et al.*, 1992).

79. Potential data availability: Three panel members thought this measure was likely to be available. Three rated data availability as possible and one member felt data collection of this measure was unlikely.

Low Birth Weight Rate

Operational definition:

80. **Source:** AHRQ/HCUP refinement.

Numerator: The number of births with ICD-9 diagnosis code for birth weight less than 2500 grams in any field. Patients transferring from another institution are excluded.

Denominator: All births (discharges in Major Diagnostic category [MDC] 15, newborns and other neonates)

Importance of the indicator

81. Low birth weight is an indicator that would be of most interest to comprehensive health care delivery systems. Healthy People 2010, a programme of the Office of Disease Prevention and Health Promotion, US Department of Health and Human Services, has set a goal of reducing the percentage of low birth weight infants to 0.9% (USDHHS, 2000).

82. Mothers who give birth to low birth weight infants generally receive less prenatal care than others, and prenatal care persists as a risk factor for low birth weight when adjusting for potential confounds. However, comprehensive care programmes in high-risk women have failed to reduce low birth weights. In some studies, specific counselling aimed at reducing a specific risk factor in a specific population may have some impact on reducing low birth weight.

83. Adequate risk adjustment may require linkage to birth records, which record many of the socio-demographic and behavioural risk factors noted in the literature review (race, age, drug use, stress). Birth records in some countries may provide a rich source of information that could help to identify causes of low birth weight and help to delineate potential areas of intervention.

84. Where risk adjustment is not possible, results may provide some guidance to case mix in the area if considered in light of measures of socioeconomic status.

85. Potential data availability*:* All panel members felt that data availability for this measure was likely.

Scientific soundness of the indicator

86. This measure set was developed by refinement and further development of the US Agency for Healthcare Research and Quality's HCUP indicators. This process involved identifying indicators reported in the literature and in use by health care organisations, evaluating both the HCUP measures and other indicators using literature reviews and empirical methods, and incorporating risk adjustment. These measures are all derived from routine hospital administrative data.

87. Face validity: Risk factors for low birth weight may be addressed with adequate prenatal care and education. Prenatal education and care programmes have been established to help reduce low birth weight and other complications in high-risk populations.

88. Construct validity: While specific studies have demonstrated an impact of particular interventions, especially in high-risk populations, evidence on the impact of better prenatal care on low birth weight rates for area populations is less well developed. In one study, the use of prenatal care accounted for less than 15% of the differences between low birth weight in black and white mothers enrolled in an HMO. However, increasing the level of prenatal care was associated with lower rates of low birth weight, particularly in the black patient population (Murray and Bernfield, 1988). Although low birth weight births account for only a small fraction of total births, the large number of births suggests that this indicator should be precisely measurable.

Operational issues

89. Need for risk adjustment: Mothers under 17 years and over 35 years are at a higher risk of having low birth weight infants (Hessol, Fuentes-Afflick and Bacchetti, 1998; O'Campo, *et al.*, 1997). One study of all California singleton births in 1992 found that after risk adjustment, having a black mother remained a significant risk factor (Hessol, Fuentes-Afflick, and Bacchetti, 1998). Little evidence exists on the extent to which each of these factors contributes to differences in the rate of low birth weight births across geographic areas.

90. Prior use: Low birth weight is an indicator in the Health Plan Employer Data and Information Set (HEDIS) measure set for US insurance plans and is used by United Health Care, a US health insurer and the University Hospital Consortium, a voluntary association of US teaching hospitals.

Adolescent Immunisation

Operational definition

91. **Source:** HEDIS 3.0 Hybrid.

> **Numerator:** The subset of the denominator who received a second dose of MMR by age 13 or who had a seropositive test result for measles, mumps or rubella by their 13th birthday.
>
> **Denominator:** A random sample of 411 enrolled adolescents whose 13th birthday was in the reporting year, who were members of the health plan as of their 13th birthday, who were continuously enrolled for 12 months immediately preceding their 13th birthday and who were not contraindicated for MMR.

Importance of the indicator

92. Impact on health: Adequate immunisation with the live, attenuated Measles-Mumps-Rubella vaccine protects children/adolescents against these diseases. Since the licensure of vaccines containing measles, rubella and mumps vaccine, the numbers of reported cases of measles, mumps and rubella and congenital rubella syndrome have decreased by > 99% in the US Studies have shown that 99% of children who receive 2 doses of measles vaccine at ≥12 months will develop serologic evidence of measles immunity. Studies have also shown that a two-dose scheme is necessary for the successful attainment of measles elimination.

93. The efficacy of rubella vaccine is >90%. Rubella immunity is crucial for the prevention of the congenital rubella syndrome, which occurs when a gravid woman is infected with the rubella pregnancy. Rubella infection during pregnancy can affect all organs in the developing foetus and cause miscarriage, foetal death and multiple congenital abnormalities, congenital deafness and blindness due to cataracts as well as mental retardation (being most prominent). The risk is greatest when infection occurs in the first trimester.

94. Mumps immunity in adolescence is also of importance, particularly regarding the avoidance of complications from this viral infection, which become more common with increasing age, *e.g.*, meningoencephalitis, orchitis in males, mastitis in females. Mumps vaccine has been shown to have an efficacy of 75-95% (CDC, 1998).

95. Policy importance: Vaccination coverage has immediate implications for health policy in terms of indicating the need for interventions to increase vaccine uptake, such as community-based interventions (*e.g.*, mass media to increase awareness, proof of vaccination upon school/college entry etc.); individual based interventions, such as patient reminder systems; and primary care and/or public health interventions such as improving access to vaccination (*e.g.*, offering vaccination in schools) (Marshall *et al.*, 2002).

96. Susceptibility to being influenced by the health system: The health care system can improve immunity through vaccination programmes and monitoring of vaccination status and offering vaccinations in schools through the public health system.

Scientific soundness of the indicator

97. Face validity: The determination of vaccination coverage as well as the measurement of serological immunity to MMR are well-established means of measuring this indicator (see content validity).

98. Content validity: The determination of vaccination coverage is an appropriate means of measuring the proportion of a specified group – in this case 13 year olds – that has received the specified vaccination – in this case the second dose of MMR. The validity of this measure will depend on the quality of documentation of vaccinations, as well as on the availability of documentation (vaccination card). Vaccination will correlate extremely well with immunity after two vaccinations. Serological measurement of immunity to measles, mumps and rubella is a more direct means of determining immunity to these antigens.

99. Reliability of vaccination coverage will depend on the quality of data collected, which depends on the method of data collection and on the quality and availability of vaccine documentation.

100. Evidence supporting indicator validity: As vaccination is closely correlated with immunity (see vaccine efficacy, above) and serological measurement of immunity is a well-established and valid means of measuring immunity (standard textbooks), evidence supporting indicator validity is strong.

Operational issues

101. Availability of interpretative data: Widely available.

102. Data availability: The WHO vaccination coverage indicator is targeted at 24 months of age; thus this would likely be more widely available than vaccination coverage at age 13.

Anaemia Screening for Pregnant Women

103. **Source:** RAND Prenatal Care.

Numerator: Anaemia screening at first prenatal visit.

Denominator: All live births.

104. Data requirements: Numerator: record of whether full blood count has been taken at first prenatal visit. Denominator: list of all live births.

Importance of the indicator

105. Clinical significance of process or outcome: Anaemia (defined as Hb < 10.4 g/dl) is more common amongst pregnant women and is statistically associated with adverse outcomes such as preterm delivery and increased perinatal mortality (McGlynn *et al.*, 2000). Whether this is a causal relationship is unclear since there are other potential causes for these pregnancy complications, which are also associated with anaemia, such as low social class and poor prenatal care. Iron supplementation during pregnancy, whilst improving haemoglobin levels, has not been shown to improve perinatal outcomes.

106. Identification of process/outcome as quality problem: Up to 10% of women become anaemic whilst pregnant. There is a higher prevalence in some ethnic subgroups.

107. Policy importance: Reducing pregnancy-related complications is an important policy goal in OECD countries.

108. Susceptibility to being influenced by the health system: As a simple screening test, the clinical practice embedded in the indicator is under the control of the health care delivery system. .

Scientific soundness of the indicator

109. Face validity: Highly acceptable routine practice amongst most health professionals.

110. Content validity: There is sufficient evidence that the test allows effective treatment of anaemia, but weak evidence that the treatment has any impact on adverse outcomes for mother or child.

Operational issues

111. Availability of interpretative data: Benchmarking data available from RAND QA studies.

Cervical Gonorrhoea Screening for Pregnant Women

Operational definition

112. **Source:** RAND Prenatal Care

Numerator: Number of cervical gonorrhoea culture conducted at first prenatal visit.

Denominator: All live births.

113. Data requirements: Numerator: Written record that cervical swab has been taken to diagnose gonorrhoea at first prenatal visit. Denominator: record of all live births.

Importance of the indicator

114. Clinical significance of process or outcome: The main benefit of screening for, and treating, gonorrhoea in pregnancy is to prevent opthalmia neonatorum, a congenital infection which may cause blindness (McGlynn *et al.*, 2000). Untreated infection during pregnancy may also cause pelvic inflammatory disease, septic abortion, chorioamnionitis and premature delivery. In addition, prenatal checks provide an opportunity for population screening, treatment and education about sexually transmitted diseases in general. Successful screening and treatment of gonorrhoea have made its complications rare nowadays. The efficacy of prenatal screening has not been examined and the costs and ethical issues associated with screening have raised some doubts about whether it should be routine practice in prenatal clinics.

115. Identification of process/outcome as quality problem: The prevalence of screening rates for gonorrhoea is not generally known in OECD countries.

116. Policy importance: The diagnosis, treatment and prevention of sexually transmitted diseases is of considerable policy importance but pregnant women represent only a very small proportion of the at-risk groups. Routine screening of prenatal patients is therefore of uncertain policy value.

117. Susceptibility to being influenced by the health system: As a simple screening test, the clinical practice embedded in the indicator is under the control of the health care delivery system. .

Scientific soundness of the indicator

118. Face validity: Routine prenatal screening for gonorrhoea is a highly acceptable routine practice in most countries.

119. Content validity: There is no evidence to support a routine screening programme in prenatal patients on cost-effectiveness grounds.

Operational issues

120. Availability of interpretative data: Benchmarking data available from RAND QA studies.

Hepatitis B Screening for Pregnant Women

Operational definition

121. **Source:** RAND Prenatal Care

Numerator: Hepatitis B screen before delivery.

Denominator: All live births.

122. Data requirements: Numerator: Written record that Hepatitis B screen has been performed during prenatal care. Denominator: number of all live births.

Importance of the indicator

123. Clinical significance of process or outcome: Nearly half of all infants born to mothers who are chronic hepatitis B carriers become infected themselves (McGlynn *et al.*, 2000). This risk increases to 90% for babies born to mothers with the hepatitis B virus e antigen. Although these perinatal infections rarely cause acute problems in neonates, they usually result in the child becoming a chronic hepatitis B carrier, with the resulting increased risk of cirrhosis and primary hepatocellular carcinoma. Hepatitis B vaccines with immunoglobin can prevent 85-90% of perinatal infections. It is unclear whether selective screening for high-risk mothers (including certain ethnic population subgroups) is a more effective strategy than routine population screening.

124. Identification of process/outcome as quality problem: Routine screening has become accepted practice in most countries and therefore screening rates are high.

125. Policy importance: The health and economic costs of hepatitis B are significant and the intervention is highly effective, so this is of considerable policy importance.

126. Susceptibility to being influenced by the health system: As a simple screening test, the clinical practice embedded in the indicator is under the control of the health care delivery system. .

Scientific soundness of the indicator

127. Face validity: Routine prenatal screening for hepatitis B in prenatal patients is a highly acceptable routine practice in most countries.

128. Content validity: Evidence of the effectiveness of screening is high but its cost-effectiveness at a population level is uncertain.

Operational issues

129. Availability of interpretative data: Benchmarking data available from RAND QA studies.

Hepatitis B Documentation in Record at Time of Delivery

Operational definition

130. **Source:** RAND Prenatal Care.

Numerator: Carrier status documented on the delivery record.

Denominator: Pregnant women carrying the Hepatitis B surface antigen.

Importance of the indicator

131. Impact of health: The risk of transmission of the hepatitis B virus from a pregnant woman if she is a hepatitis B virus carrier is 40-45%. This risk is increased to 65-90% if the woman also carries the hepatitis B virus e antigen. In Germany, the proportion of hepatitis B carriers in the general population is 0.6%. Infected newborns have a risk of 85-90% of becoming hepatitis B virus carriers. This entails a markedly increased risk of developing chronic active hepatitis, cirrhosis and primary hepatocellular carcinoma years later. This can be prevented in 85-90% of cases by a combination of treatment with hepatitis B immune globulin and active hepatitis B vaccination. As selective screening was shown to miss

a large proportion of carrier mothers, universal screening is recommended in pregnancy in many countries (Murata, Gifford and McGlynn, 1994).

132. Policy importance: Knowledge of the proportion of delivery records with documentation of the hepatitis B carrier status has implications for health policy in that a high proportion of records with missing data would indicate that some cases of neonatal hepatitis B may be being missed. This could lead to awareness campaigns for obstetricians and family practitioners as well as the general population.

133. Susceptibility to being influenced by the health system: Documentation of the hepatitis B carrier status of pregnant women in the delivery record implies prenatal screening of the mother. This could be encouraged by making available prenatal screening recommendations, prenatal screening record forms, billing incentives, etc.

Scientific soundness of the indicator

134. Face validity: The documentation of the carrier status in the delivery record seems an appropriate reflection of prenatal screening of the mother's hepatitis B carrier status.

135. Content validity: Abstraction of the delivery record with regard to documentation of the carrier status is a valid measure. Reliability will depend on the quality of the data abstraction and the quality of the documentation.

Hepatitis B Immunisation for High-Risk Groups

Operational definition

136. **Source:** NPCRDC Project.

Numerator: Number offered three doses of HBV within 1 year.

Denominator: (1) babies of mothers who are chronic carriers of hepatitis B, (2) babies who have had acute hepatitis B during pregnancy, (3) parenteral drug misusers, (4) haemophiliacs or those receiving regular blood products, (5) patients with chronic renal failure on dialysis.

Importance of the indicator

137. Impact on health: Hepatitis B vaccine is efficacious and well-tolerated. The recommended series of 3 vaccine doses of hepatitis B vaccine results in an overall vaccine efficacy of 85 to 95%. Virtually complete protection is provided by HBs titers > 10mIU. While the recommended series of 3 doses of vaccine leads to a protective antibody response in > 90% of adults under 40 years, this declines to 65-75% of persons aged ≥60 years (Mahoney and Kane, 1999).

138. The incidence of hepatitis B varies markedly worldwide (Mahoney and Kane, 1999). In areas of high endemnicity, the prevalence of chronic infection is high, with ≥8% of the population being HbsAg-positive and the lifetime risk of hepatitis B being > 60% (*e.g.*, most of Asia except Japan and India, most of the Middle East, the Amazon Basin, most Pacific Island groups, Africa and other special populations such as Australian aborigines and Maoris in New Zealand). In areas of moderate prevalence, 2-7% of the population is HbsAg-positive and the lifetime risk of infection is 20 to 60%, and in low prevalence areas, < 2% of the population is chronically infected, and most infections occur in well defined risk groups. In the US, about one third of chronic infections are acquired through perinatal transmission and early childhood exposures. Worldwide, there are about 500 000-1 million deaths due to Hepatitis B infection each year.

139. The risk of chronic infections is highest in newborns and children (90% in newborns, 30% in children and 10% in adults), and is associated with a high risk of developing cirrhosis and liver cancer.

140. Policy importance: Hepatitis B vaccination coverage has immediate implications for health policy in terms of indicating the need for interventions to increase vaccine uptake, such as community-based interventions (*e.g.*, mass media to increase awareness, proof of vaccination upon school/college entry etc.), individual based interventions such as patient reminder systems, primary care and/or public health interventions such as improving access to vaccination (*e.g.*, offering vaccination in schools) (CDC, 1997).

141. Susceptibility to being influenced by the health system: The health care system can influence vaccination coverage in risk groups through medical education, awareness campaigns, improving access to vaccination, establishing reminder and recall systems, and covering related patient costs.

Scientific soundness of the indicator

142. Face validity: The determination of vaccination coverage is a well-established means of measuring vaccine-induced immunity against hepatitis B (see content validity).

143. Content validity: The determination of vaccination coverage is an appropriate means of measuring the proportion of specified groups – in this case specific high risk groups – that have received the specified vaccination – in this case hepatitis B vaccination. The validity of this measure will depend on the quality of vaccination documentation as well as on its availability.

144. Reliability of vaccination coverage will depend on the quality of data collected, which depends on the method of data collection and on the quality and availability of vaccination documentation.

145. Evidence supporting indicator validity: See adolescent immunisation, above.

Operational issues

146. Availability of interpretative data: widely available.

147. Data availability: Routine data on vaccination coverage in specific risk groups is likely limited; data would possibly be available in sporadically-conducted surveys in some countries.

Influenza Vaccination for High-Risk Groups

Operational definition

148. **Source:** NPCRDC Project.

Numerator: Number offered an annual influenza vaccination.

Denominator: (1) Patients with chronic respiratory diseases, (2) patients with chronic heart disease, (3) patients with chronic renal failure, (4) patients with diabetes, (5) patients with immunosuppression of any cause, (6) residents of nursing and residential homes, (7) anyone aged over 75.

Importance of the indicator

149. Impact on health: Influenza epidemics occur in the winter months on an annual basis, causing disease in all age groups. Infection occurs most frequently among children but causes highest morbidity and mortality in the elderly. Epidemics are associated with increased rates of physician consultations, hospital admissions and excess deaths. From an economic perspective, there is an increase in days lost to absence from work and school. Global epidemics can occur, associated with increased rates of illness and death from influenza-related complications. The most important preventive measure for reducing the risk of influenza is vaccination with inactivated vaccine. The use of influenza-specific antiviral drugs for chemoprophylaxis or treatment of influenza is also possible as a complementary measure. When vaccine and the epidemic influenza strains are well matched, achieving high vaccination coverage among persons in closed settings such as chronic care facilities and among staff can induce herd immunity, thereby further reducing the risk of infection.

150. The effectiveness of influenza vaccines depends on the degree of similarity with the inactivated vaccine virus strains and those in circulation. In addition, vaccine effectiveness is lower in older and immune compromised persons. In healthy adults < 65 years of age, annual vaccination prevents illness in 70-90% of persons vaccinated when the antigenic match is adequate. Vaccination of healthy adults has also been shown to decrease time lost from work as well as use of health care resources. Vaccine efficacy is lower in older persons and those with certain chronic diseases; however, in such cases, the vaccine can still prevent secondary complications and reduce the risk for hospitalisation (by 30-70% among non-institutionalised elderly persons) and death due to influenza. In institutionalised elderly persons, influenza vaccination has been shown to be 50-60% effective in preventing hospitalisation of pneumonia and 80% effective in preventing death, although only 30-40% effective in preventing any illness due to influenza (CDC, 2000; Fleming, 2000).

151. Policy importance: Influenza vaccination coverage has immediate implications for health policy in terms of indicating the need for interventions to increase vaccine uptake, such as community-based interventions (*e.g.,* mass media to increase awareness), individual based interventions such as patient reminder systems, primary care, hospital-based (*e.g.,* vaccination of all patients at increased risk prior to influenza seasons if admitted to hospital) interventions and/or public health interventions such as improving access to vaccination (*e.g.,* offering vaccination in public places such as shopping centres etc.) (Marshall *et al.*, 2002; CDC, 2000).

152. Susceptibility to being influenced by the health system: The health care system can influence vaccination coverage in risk groups through medical education, awareness campaigns, improving access to vaccination, establishing reminder and recall systems, and covering related patient costs.

Scientific soundness of the indicator

153. Face validity: The determination of vaccination coverage is a well-established means of measuring the degree of vaccine-induced protection against influenza.

154. Content validity: The determination of vaccination coverage is an appropriate means of measuring the proportion of specified groups – in this case specific high risk groups – that have received the specified vaccination – in this case influenza vaccination. The validity of this measure will depend on the quality of vaccination documentation as well as on availability of documentation.

155. Reliability of vaccination coverage will depend on the quality of data collected, which depends on the method of data collection and on the quality and availability of vaccine documentation.

156. Evidence supporting indicator validity: See adolescent immunisation indicator, above.

Operational issues

157. Availability of interpretative data: widely available.

158. Data availability: Routine data on vaccination coverage in the specific risk groups is likely to be limited; data would possibly be available in sporadically-conducted surveys in some countries. Vaccine coverage data in elderly persons are more likely to be collected on a regular basis.

Pneumococcal Vaccination for High-Risk Groups

Operational definition

159. **Source:** NPCRDC Project.

Numerator: Number receiving pneumococcal vaccination.

Denominator: Patients with (1) asplenia or severe splenic dysfunction, (2) chronic respiratory disease, (3) chronic heart disease, (4) chronic renal failure or nephrotic syndrome, (5) immunosuppression of any cause, (6) chronic liver disease, (7) diabetes.

Importance of the indicator

160. Impact on health: Pneumococcal disease, particularly pneumonia and invasive pneumococcal disease (meningitis and sepsis) is an important source of morbidity and mortality, particularly in the very young and in older age groups, in persons with underlying chronic disease, in immunosuppressed persons and in persons with asplenia. In the US, pneumococcal disease causes approximately 3 000 cases of meningitis, 50 000 cases of bacteremia, 500 000 cases of pneumonia and 7 million cases of otitis media annually. The incidence of bacteremia is estimated at 15-30 per 100 000 population, but is higher among persons ≥ 65 years of age, at 50-83 cases per 100 000 population (CDC, 1997). The incidence of pneumococcal meningitis is 1-2 cases per 100 000 population. Specific groups of persons have a higher risk of acquiring invasive pneumococcal disease – these include blacks, native Americans and Alaska Natives, nursing home residents, alcoholics, persons with underlying chronic medical or immuno-deficient conditions. Mortality of invasive disease is high, at 16-36% among all adults, but 28-51% in persons aged ≥65 years (Fedson, Musher and Eskola, 1999).

161. Studies of vaccine efficacy are summarised in the report by the Advisory Committee on Immunisation Practices (ACIP) in the US (CDC, 1997). According to this evidence, as well as more recent meta-analyses (Honkanen and Mäkela, 1999; Artz, Ershler and Longo, 2003; Fine *et al.*, 1994; Jackson *et al.*, 2003; Watson, Wilson and Waugh, 2002) vaccine efficacy for prevention of invasive pneumococcal disease lies between 56-81%. One systematic review of randomised controlled trials did not show a significant protective effect against invasive pneumococcal disease (Watson, Wilson and Waugh, 2002). There is no evidence for protection from non-invasive pneumococcal disease. One study showed that pneumococcal and influenza vaccination of persons with chronic lung disease decreased hospitalisation due to pneumonia and influenza by 43% and decreased overall mortality by 29% (Nichols *et al.*, 1999). Vaccine efficacy is lower in older and immuno-compromised persons; limited data show that the vaccine is 65%-84% effective in preventing invasive disease in specific patient groups (patients with diabetes mellitus, coronary vascular disease, congestive heart failure, chronic lung disease and anatomic asplenia (Butler *et al.*, 1993).

162. Policy importance: Pneumococcal vaccination with the polysaccharide vaccine has been shown to protect against invasive pneumococcal disease, although not against pneumonia. The recently available conjugate pneumococcal vaccine is effective in preventing invasive pneumococcal disease in children under 2 years of age.

163. Susceptibility to being influenced by the health system: The health care system can influence vaccination coverage in risk groups through awareness campaigns for professionals (including medical education) and the public, improving access to vaccination, establishment of reminder and recall systems, through coverage of costs.

Scientific soundness of the indicator

164. Face validity: The determination of vaccination coverage is a well-established means of measuring this indicator (see content validity).

165. Content validity: The determination of vaccination coverage is an appropriate means of measuring the proportion of specified groups – in this case specific high risk groups – that have received the specified vaccination – in this case pneumococcal vaccination. The validity of this measure will depend on the quality of vaccination documentation as well as on availability of documentation.

166. Reliability of vaccination coverage will depend on the quality of data collected, which depends on the method of data collection and on the quality and availability of vaccine documentation.

167. Evidence supporting indicator validity: see above (adolescent immunisation)

Operational issues

168. Availability of interpretative data: Widely available.

169. Data availability: Data on pneumococcal vaccination coverage in specific risk groups are not widely available on a routine basis in most countries. Vaccination coverage in older age groups is presumably an exception in most countries; however, the age group for which data is collected is likely to vary.

Diagnosis and Treatment/Primary Care

Congestive Heart Failure Readmission Rate

Operational definition

170. **Source:** CIHI Primary Care

Numerator: Number of inpatient CHF hospitalisations with a readmission within 28 days, age 15-84. Exclude LOS < 3 days and readmission for CABG, PTCA, angioplasty, or pacemaker insertion. Exclude cancer, HIV and trauma cases.

Denominator: Total number of CHF episodes in an 11-month period.

Importance of the indicator

171. Impact on health: Congestive heart failure is a common chronic disease in industrialised countries, and entails significant morbidity and mortality. Rigorous outpatient management has been shown to reduce disease progression and the need for hospital care.

172. Policy importance: Patients with congestive heart failure frequently require hospitalisation for re-compensation and treatment of complications, such as pneumonia. Provided that patients are discharged in adequate functional status and with appropriate follow-up instructions, there should not be the need for a repeated admission within a short interval. The high cost of hospital care, combined with the high prevalence of the disease, underscore the policy relevance of measuring readmission rates.

Scientific soundness of the indicator

173. Face validity: Helping chronically ill patients to cope with their diseases is an important goal for a health care system. Thus, measuring readmission rates for congestive heart failure appears to be a plausible indicator. However, it has to be kept in mind that it is not necessarily an indicator for primary care only. The risk of readmission may be related to the type of drugs prescribed at discharge, patient compliance with post-discharge therapy, the quality of follow-up care in the community, or the availability of appropriate diagnostic or therapeutic technologies during the initial hospital stay. Consequently, readmission rates reflect quality of hospital care as well as primary and community-based care (Lee *et al.*, 2003).

174. Construct validity: Measuring readmission places great demands on data availability and quality. Restrictions on data access and confidentiality/privacy rules may prevent the construction of this measure in some countries.

First Visit in First Trimester

Operational definition

175. **Source:** RAND Prenatal Care.

Numerator: First prenatal visit in first trimester.

Denominator: All live births.

Importance of the indicator

176. Clinical significance of process or outcome: Adequate prenatal care has been shown to reduce pregnancy complications for both the mother and the baby. Potential risk factors can be identified early and possibly addressed and women can be educated about nutrition, further care and symptoms that may indicate a complication.

177. Identification of process/outcome as quality problem: In particular, women of lower socio-economic status are known to seek prenatal care only when complications occur, rather than early on in their pregnancy.

178. Policy importance: Providing care for pregnancy related complications, in particular for pre-term delivery is immensely costly. Pre-term babies have an increased risk of mental and physical disability. Promoting adequate prenatal care is therefore a policy goal in many countries.

179. Susceptibility to being influenced by the health system: Primary care providers, as the first contact point for many, can educate women about the need for prenatal care. The public health system can raise the awareness of this problem by educational and outreach campaigns.

Scientific soundness of the indicator

180. Face validity: As getting in touch with the health system is a precondition for adequate prenatal care, it is widely accepted that pregnant women should receive an initial visit in the first trimester.

181. Content validity: The indicator was selected by an expert panel recommendation based on a literature review, published by the RAND Corporation.

Smoking Cessation Counselling for Asthmatics

Operational definition

182. **Source:** NPCRDC Project.

Numerator: Number of patients who have been advised on how to stop smoking using a combination of advice and support from a health professional.

Denominator: Patients with asthma who are smokers.

Importance of the indicator

183. Asthma is a chronic disease with a prevalence of about 5% in the population. In the UK 6% of children and 3-4% of adults have asthma (Marshall *et al.*, 2002). In Germany the prevalence of asthma in the middle aged population (25-69 years) is increasing from 3% in 1984 to 7% in 1998 (self reported in national health surveys) (Hermann-Kunz, 2000). The annual cost of asthma in the UK is around 2 000 million pounds. Most of this is indirect cost, through lost work days, and is estimated at 1 139 million pounds.

Scientific soundness of the indicator

184. Face validity: Smoking is a proven risk factor for asthma attacks. The primary care health system should thus counsel asthmatics to cease smoking. Smoking cessation programmes vary by country. In general, cessation advice should be accompanied by a discussion of nicotine replacement therapy and professional smoking cessation support programmes.

185. Construct validity: Smoking behaviour in society is dependent on many factors. For example some countries prefer popular anti-smoking campaigns, others rely more on liberal convictions. These factors influence the attitude towards smoking and therefore the acceptance of smoking-cessation programmes.

186. Reliability: Data sources for this indicator may not be routinely available, since most countries will not have a registry on treatment for asthmatics in primary care. Sometimes it may be possible to collect the data in population surveys, which are routinely conducted in all countries.

Blood Pressure Measurement

Operational definition

187. **Source:** NPCRDC Project.

Numerator: Number of patients with blood pressure measured within the past five years.

Denominator: Adults over the age of 25.

188. Data requirements: Numerator: record of whether blood pressure has been measured in previous 5 years. Denominator: list of all adults over the age of 25.

Importance of the indicator

189. Clinical significance of process or outcome: Hypertension is common in developed countries, with a prevalence of around 10% in the adult population (Marshall *et al.*, 2002). Blood pressure has a positive, continuous and independent association with the risk of developing stroke and coronary heart disease. A prolonged reduction of 5mg Hg in usual diastolic blood pressure is associated with reduction of at least one-third of the risk of stroke and one-fifth of the risk of coronary heart disease. No threshold relationship exists between blood pressure and risk. Thus, for the majority of individuals, a lower blood pressure confers a lower relative risk of vascular disease, whether conventionally normotensive or hypertensive.

190. Identification of process/outcome as quality problem: There is good evidence of quality problems in all countries which have examined the quality of care for blood pressure (McGlynn *et al.*, 2003; Seddon *et al.*, 2001). For example, a systematic review of the quality of primary care in the UK, Australia and New Zealand, demonstrated that in 11 studies, between 77 and 86% of subjects over the age of 65 years had had their BP measured in the previous 5 years (Seddon *et al.*, 2001). The results are likely to be less good in younger age groups.

191. Policy importance: Cardiovascular disease (CVD) is the principal cause of mortality and morbidity in developed countries and hypertension is one of the key risk factors for developing CVD.

192. Susceptibility to being influenced by the health system: A combination of public education campaigns, an efficient system of primary care and effective call and recall systems can all improve the monitoring and management of blood pressure.

Scientific soundness of the indicator

193. Face validity: Case finding is a prerequisite for diagnosis and management and therefore the face validity of screening for blood pressure is high amongst clinical staff and professional groups.

194. Content validity: There is good evidence from population-based randomised controlled trials that treatment of blood pressure reduces morbidity and mortality from vascular disease. The evidence relating to primary care practice has recently been summarised (Marshall *et al.*, 2002).

Operational issues

195. Need for/availability of case-mix adjustment: Since screening for blood pressure is a simple technical process, it could be argued that at a national population level it would be inappropriate to adjust for case mix.

196. Availability of interpretative data: Audits of blood pressure screening rates in a range of countries (Seddon *et al.*, 2001; McGlynn *et al.*, 2003) provide benchmarking data for this indicator.

Re-Measurement of Blood Pressure for those with High Blood Pressure

Operational definition

197. **Source:** NPCRDC Project.

Numerator: Number with blood pressure re-measured within 3 months.

Denominator: Patients with a blood pressure of 160/100 or higher.

Importance of the indicator

198. Clinical significance of process or outcome: Blood pressure has a well-established independent association with stroke and coronary heart disease. Evidence based on randomised controlled trials of antihypertensive treatment has been presented which indicates that the effects of lowering of blood pressure on reduction of stroke is 38% while the reduction of CHD is 18%. Both results were highly statistically significant (Marshall *et al.*, 2002). Given the overall mortality and morbidity associated with stroke and CHD indications concerning blood pressure management are highly important.

199. Identification of process/outcome as quality problem: Re-measurement of blood pressure in instances of identified high blood pressure is a key component in the management of hypertension and evidence has been produced to indicate that without such management patient are exposed to a clearly higher risk of cardiovascular complications and death.

200. Policy importance: Hypertension is a common disorder and has substantial effects on morbidity and mortality, but adequate treatment has been shown to avoid long-term complications.

201. Susceptibility to being influenced by the health system: This is an area that is clearly susceptible to direct influence by the health care system by appropriate antihypertensive drug treatment. In addition, measures to address lifestyle issues are vital in dealing with these problems and again this is an area which needs to feature strongly in multidisciplinary approaches relating to health and in health impact assessment. Given the evidence of links between management of blood pressure and CHD/CVD risk, this is an important area to include in a key set of primary care indicators.

Scientific soundness of the indicator

202. Face validity: As patients with hypertension respond very differently to drug treatment, it is highly plausible to assess the effectiveness of the initial drug regime.

203. Content validity: There is good evidence from population-based randomised controlled trials that treatment of blood pressure reduces morbidity and mortality from vascular disease. The evidence relating to primary care practice has recently been summarised (Marshall *et al.*, 2002).

Initial Laboratory Investigations for Hypertension

Operational definition

204. **Source:** NPCRDC Project.

Numerator: Number with the following tests within 3 months of diagnosis: (1) urine strip test for protein, (2) serum creatinine and electrolytes, (3) blood glucose, (4) serum/total cholesterol, (5) ECG.

Denominator: Patients diagnosed with hypertension.

Importance of the indicator

205. Clinical significance of process or outcome: Those simple test look for complications of hypertension, such as renal disease, and for other vascular risk factors that are known to occur in combination with hypertension and to multiply its negative effect on the vascular system.

206. Identification of process/outcome as quality problem: This is an even better 'cleaner' proxy for good practice than PP098 and if procedures are good in relation to the ordering and follow-up for these tests then it seems likely that other items are being dealt with well in the primary care system concerned.

207. Policy importance: Hypertension is a common condition in industrialised countries and a leading cause of heart disease, stroke and renal failure. Adequate treatment can substantially reduce the risk of long-term complications and thus future spending.

208. Susceptibility to being influenced by the health system: The primary care system typically provides these services and ought to ensure that newly diagnosed hypertensive patients receive those tests.

Scientific soundness of the indicator

209. Face validity: This set of tests represents a basic initial assessment of a patient with hypertension and appear highly plausibly from a clinical standpoint.

210. Content validity: All five tests are common and simple screening procedures, the content validity is therefore high. The indicator is based on an expert panel recommendation.

Hospitalisation for Ambulatory Care Sensitive Conditions

Operational definition

211. **Source:** CIHI Primary Care.

Numerator: Total number of hospital admissions for ambulatory care sensitive conditions: diabetes mellitus, alcoholic psychoses, drug psychoses, neurotic disorders, alcoholic dependence syndrome, drug dependence, nondependent abuse of drugs, depressive disorder not elsewhere classified, essential hypertension, hypertensive heart disease, hypertensive renal disease, hypertensive heart and renal disease, secondary hypertension and asthma.[5]

Denominator: Total population.

Importance of the indicator

212. Clinical significance of process or outcome: Avoidable hospitalisations are those conditions that could have been avoided if proper ambulatory care had been received and can thus be seen as a measure of access to appropriate medical care. While not all admissions for ambulatory care sensitive conditions are avoidable, it is assumed that appropriate prior ambulatory care could prevent the onset of this type of illness or condition, control an acute episodic illness or condition, or manage a chronic disease or condition. A disproportionately high rate is presumed to reflect problems in obtaining access to primary care (Weissman, Gatsonis and Epstein, 1992).

213. Identification of process/outcome as quality problem: The rate of Ambulatory Care Sensitive (ACS) hospitalisations is considered an index of access of a population to adequate primary care. These are hospitalisations for selected diagnoses some of which might reasonably have been prevented if primary care had been received in time. ACS hospitalisations are elevated in low-income areas and in rural/frontier areas.

214. Policy importance: Given the high cost of hospital care and the high prevalence of the disease included in this indicator, elevated ACS hospitalisation rates could point not only towards possibilities to improve quality but also to substantial cost savings, if better primary care were provided. In addition, the ACS hospitalisation rate appears sensitive to the presence or absence of economic barriers to access. It has been reported to be lower and/or less correlated with socioeconomic status in countries with national health insurance (Billings, Anderson and Newman, 1996).

215. Susceptibility to being influenced by the health system: Appropriate prior ambulatory care could prevent the onset of an illness or condition; control an acute episodic illness or condition; or manage a chronic disease or condition (Anderson, 1996).

Scientific soundness of the indicator

216. Face validity: Managing chronic diseases to prevent complications and exacerbations is regarded as a core task of the primary health care system.

217. Content validity: As mentioned above, several groups have advocated measures of ACS hospitalisation rates. The fact that hospital admission diagnoses are readily available in most countries

5. The members of the Panel also recommended looking at admission rates for hypertension and diabetes separately, because those represent the largest components of this composite indicator.

implies that the indicator can be easily constructed. However, it should be mentioned that there remains some controversy about this (and similar) measures as a quality indicator, because ACS hospitalisation rates reflect access to, as well as quality of, primary care. Also, defining the appropriate level of hospital admission rates for those conditions is difficult, because in a subset of cases an admission is clearly warranted.

ANNEX 2: MEMBERS OF THE PANEL

Martin Marshall (Co-Chair)

218. Martin Marshall B.Sc, MB BS, M.Sc, MD, FRCGP is a Professor of General Practice at the National Primary Care Research and Development Centre, University of Manchester and a part-time general practitioner in an inner-city practice. Prior to this he was a principal in general practice in Exeter for 10 years. His research interests are in the field of policy-related quality of care – the development, use and abuse of quality indicators in primary care, the public disclosure of information about performance and the relationship between organisational culture and quality improvement. He was a Harkness Fellow in Health Care Policy in 1998/99, based at the RAND Corporation, California. He was a member of the GMC/RCGP working group that produced Good Medical Practice for General Practitioners. He is currently member of the RCGP Research Group, an advisor to the Commission for Health Improvement and their Office for Healthcare Information, the Modernisation Agency, the National Clinical Assessment Authority, the National Patient Safety Agency and the National Primary Care Collaborative. He is vice-president of the European Working Group on Quality in Family Practice and a member of the Manchester Performance Panel.

Sheila Leatherman (Co-Chair)

219. Sheila Leatherman is a Research Professor at the School of Public Health, University of North Carolina, a Senior Associate of The Judge Institute of Management (1996) and Distinguished Associate at Darwin College (1997) at the University of Cambridge, England. Actively working in the US and UK, her primary areas of research, policy analysis and publication are quality of care, health systems reform, performance measurement and improvement, and managed care. She was elected as a member of the Institute of Medicine of the National Academy of Sciences in 2002. Sheila Leatherman has a broad background in health care management including positions in State and Federal health agencies, as CEO of a group-network HMO and as Executive Vice-president of United Health Group, one of the largest managed care companies in the US She founded The Center for Health Care Policy and Evaluation in the early 1990's which conducted pioneering research in the use of administrative data for the monitoring and measurement of quality of care for enrolled populations (awarded a US Patent in 1996). She was appointed by President Clinton in 1997 to the President's Commission on Patients Rights and Quality, for which she chaired the Panel to develop a national strategy for quality measurement and public reporting. She is the lead author of a series of Chart books on Quality of Care in the US Commissioned by The Nuffield Trust (UK); she is currently conducting research to evaluate the mid-term impact of the ten year quality agenda (announced 1998) in the NHS which will be disseminated as a book published in the fall 2003. Professor Leatherman is currently serving her third term as a member of the Health Services Board of the Institute of Medicine. She is an elected member of the National Academy of Social Insurance, a member of the RAND Health Advisory Board, the Technical Advisory Committee of the National Quality Forum, the Advisory Board of Johns Hopkins University Bioethics Center, a senior advisor to The Nuffield Trust (UK) and chief policy advisor to the PPP Foundation (UK).

Charlie Hardy

220. Charlie Hardy is head of the Planning and Evaluation Unit in the Irish Department of Health and Children. He has worked in the Department for over twenty years in the ICT Human Resources and Planning areas. He has been the representative of the Irish Ministry dealing with health matters in relation to the OECD Directorate for Employment Labour and Social Affairs and chief data correspondent for the OECD health database for the past six years. He has also taken part in various projects under the EU public health programme and with EUROSTAT mainly on areas using the OECD System of Health Accounts. The main focus of his work in the Department has been on the development of service planning and performance indicators within the Irish health system. Mr. Hardy is a member of the Health Research Board in Ireland and is responsible for the development of policy on health technology assessment and is working with a team in the Department on a National Health Information Strategy for the Irish health services.

Niek Klazinga

221. Niek Klazinga is since 1999 professor of social medicine at the University of Amsterdam and chair of the department of social medicine at the Academic Medical Centre (AMC/UvA). He holds an MD degree from the State University of Groningen (1984) and a PhD degree from the Erasmus University Rotterdam (1996; thesis on quality management of medical specialist care in The Netherlands). Between 1985 and 1999 Niek Klazinga worked at the Dutch Institute for Quality Improvement in Health Care (CBO) as (chief) scientific officer. During this period he was actively involved in quality assurance activities in hospitals and between 1989 and 1995 he was project leader of two EU funded international projects on quality assurance in European hospitals (COMAC, BIOMED I). Between 1994 and 1999 he was also a part-time associated professor at the department of Health Policy and Management at the Erasmus University Rotterdam (iBMG/EUR). Since then he is also programme director of the master programme on Health Services Research of NIHES (Netherlands Institute of Health Sciences). He participated as a partner in the EU project on external quality assurance strategies (ExPert) and on the quality of practice guidelines (AGREE).

222. Niek Klazinga published widely in peer-reviewed journals on quality of care and has over the past 15 years given hundreds of lectures on quality in health care. His present research activities concentrate on public health and health services research, more specifically on the development and use of quality indicators and quality systems in health care systems. Present committee activities include the chairmanship of the committee on quality of Health Services Research and the committee on Effective Implementation of ZON/MW (Dutch Council on Research and Development) and membership of expert committees of the NIAZ (Dutch Accreditation Institute) and HKZ (Dutch Certification Institute in health Care). Niek Klazinga represents at present the Dutch government in the OECD project on quality indicators and serves as technical advisor towards WHO/EURO in a project on the development of a Hospital Performance Indicator Framework.

Eckart Bergmann

223. Eckardt Bergmann is working more than 25 years as a sociologist at the Robert Koch-Institute in Berlin, Germany. The Robert Koch-Institute (former federal health office) is a research institute of the Federal Ministry of Health and Social Security. Now, he is working in the department of Epidemiology and Health Reporting. The German federal health reporting system is monitoring the status of health, health behaviour, risk factors, health care utilisation, costs and resources of the health care system on the national level. The health reports offer action-oriented information on health-related topics and provide a scientific basis for health policy decisions. In this area Bergmann is responsible for loss of work days, occupational diseases and industrial accidents. His main field of research is the German health system.

Other fields of interests are statistics und computer sciences. His last two research projects at the RKI were to estimate the "Costs of Alcohol Related Diseases in Germany" and to analyse the "High Users of Health Services". Prior to coming to the RKI, he was a Research Assistant in regional mobility and health system at the Technical University of Berlin, where he had studied Sociology (Magister Artium). Additionally he received a doctoral degree in Sociology at the Free University of Berlin.

Luis Pisco

224. Luis Pisco is a physician with a long term interest in Quality Improvement. He is the Director of the National Institute and a representative of the Ministry of Health in the National Council for Quality in Health. Since January of 1999 he has been the President of the Portuguese Association of General Practitioners. He is currently serving a term on the European Society of Family Medicine and is chairman of the International Committee of the APMCG and Co-ordinator to the Quality Improvement Working Group of the APMCG. Since 1991 he has been the Portuguese delegate to the European Working Group on Quality Assurance (EQuiP). His has worked in the field of Quality Improvement as a collaborator with the General Practice Institute of the South, adviser of the Department of Promotion and Quality Assurance of the Health General Directorate of the Ministry of Health and national co-ordinator of several Quality Improvement projects. He has worked at the National Secretariat for Quality of the General Health Directorate of the Ministry of Health. He has coordinated and taught more then 50 Courses on Quality Assurance and Continuous Quality Improvement, organised by the APMCG, General Practice Institutes and Regional Health Authorities. He is a member of the International Advisory Committee of the European Forum for Quality Improvement in Health Care and the Editorial Board of "Quality in Primary Care" and International Editorial Board of the "International Journal of Medicine". His membership in scientific societies includes Portuguese Medical Association, Portuguese Association of General Practitioners, Lisbon Scientific Society of Medical Sciences, Portuguese Society of Occupational Health, Portuguese Association for Quality, Association for the Promotion of Public Health.

Jan Mainz

225. Jan Mainz is a medical doctor and has a Ph.D in quality improvement. He is project manager of The National Indicator Project in Denmark and Associate Professor at the University of Aarhus, Denmark. He has been appointed as research fellow at Harvard School of Public Health, Department for Health Policy and management, Center for Quality of Care research and Education. He has worked as external medical officer at the WHO, Regional office for Europe. Dr. Mainz has since 1999 been President of The Danish Society for Quality in Health Care and Board member of The European Society for Quality in Health Care. He is member of the Advisory Committee of The European Forum for Quality Improvement in Health Care. He is also member of the Editorial Board of The International Journal for Quality in Health Care.

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