

# The EUHPID Health Development Model for the classification of public health indicators

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ON BEHALF OF THE EUHPID THEORY WORKING GROUP AND  
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## SUMMARY

*The European Community Health Promotion Indicator Development Model has been developed as the basis for establishing a European set of indicators for monitoring health promotion interventions. This paper offers the model more generally as a common frame of reference for broader public health practice and indicator development. The model builds around the physical, mental and social health of individuals and shows how health develops by interaction between individual and environmental health determinants. It demonstrates that health development can be analysed from a salutogenic and a pathogenic*

*perspective and explains how the differing starting points of different intervention approaches such as health promotion and health care are related to these two perspectives. Finally, a classification system for pathogenic and salutogenic public health outcome indicators is derived from the model and has been applied to the current core list of the European Community Health Indicator system. The model and its application highlight the need for systematic salutogenic indicator development in the field of public health and for strengthening the health promotion perspective in the future.*

*Key words:* public health model; classification system; indicators

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## INTRODUCTION

The European Union (EU) Public Health Knowledge and Information System aims at:

‘making accurate information readily available and accessible concerning the health status of the population to improve the health status of European citizens’ (Moliner, 2004).

The EU approach endorses the Lalonde Health Field Concept (Lalonde, 1974). This approach has been endorsed more recently by setting these main determinants within each other and highlighting interrelationships between macro, meso and micro aspects (Dahlgren and

Whitehead, 1991; Green *et al.*, 1997). The first set of common European Community Health Indicators (ECHIs) was produced in early 2001 by the ECHI-1 Project (Kramers, 2003). It proposed four main categories of indicators:

- Demographic and socio-economic factors;
- Health status;
- Determinants of health; and
- Health systems (including health promotion).

These four main categories can be understood more logically and precisely as one category for the relevant outcome (health status) and three for its determinants, of these, two are further specified [demographic and socio-economic factors,

health systems (including health promotion)] and one is an unspecified open category (determinants of health).

Apart from indicators covered by regularly available data, the EC has highlighted the need for indicator development in the areas for which data are currently difficult to collect, but is of key importance from a policy perspective (European Community, 2004). For that, an adequate model of health development and health promotion seems to be of fundamental importance.

### **The European Community Health Promotion Indicator Development (EUHPID) Project**

As part of the overall ECHI system, the EUHPID Project was funded by EC to improve the monitoring of the promotion of health through the development of a common dataset of corresponding indicators. EUHPID sought to develop a model to underpin its work which demonstrates how public health and health promotion approaches are related. This model would then become the rational basis for selecting adequate indicators which reflect the particular health promotion perspective.

The EUHPID Health Promotion Model has three major objectives:

- To provide a clear rationale for selecting, organizing and interpreting health promotion indicators (classification system);
- To communicate the unique health promotion approach to the larger public health community (advocacy tool); and
- To develop a common frame of reference for the fields of health promotion and public health which shows their interrelationship (dialogue tool).

The EUHPID Consortium adopted accepted international public health and health promotion terminology with their related values and principles, and sought to reduce the complexity of the dynamic, ongoing health development process. It aimed to achieve the latter by depicting only the key elements or categories to be covered by public health and health promotion indicators and how these elements are interrelated.

Initially, the Consortium conducted an in-depth review of existing health promotion models for indicator development (Davies *et al.*, 2002). Since the reviewed models did not sufficiently meet the above objectives, the

Consortium decided to develop their own model. Several versions of the EUHPID Health Promotion Model were drafted, critically reviewed by the Consortium and tested by applying it to existing indicator systems (Davies *et al.*, 2004; Bauer *et al.*, 2003).

The model was designed to cover the following contents more explicitly:

- Following the World Health Organization (WHO) definition, health includes three dimensions of physical, mental and social health;
- Health develops by an ongoing interaction between the individual and his/her environment;
- Ongoing health development can be analysed from salutogenic (health resources and positive health) or pathogenic perspectives (risk factors and disease);
- Ongoing health development should be distinguished from intentional and specific interventions into this process to maintain and improve health; and
- For health promotion interventions, the Ottawa Charter (World Health Organization, 1986) action areas specify both health promotion actions and health promoting areas to be targeted by these actions.

Thus, the resulting version of the EUHPID Health Promotion Model keeps the important distinction between health development as an ongoing process of human life and health promotion as one particular intentional and planned approach aiming at sustainable change in the health development process.

An initial paper documented in detail the early developmental work of the EUHPID Project, including the theoretical approach taken (Bauer *et al.*, 2003). The current paper will focus on a description, analysis and recommended use of the health development part of the overall EUHPID Health Promotion Model and offer it as a major contribution to the public health field, and as a policy-relevant, common frame of reference for public health and health promotion development.

The socio-ecological model of health promotion, as an intentional input into salutogenic and pathogenic health development, will be described and its significance highlighted to health promotion practice and indicator development in a companion paper (G. Bauer, J.K. Davies, J. Pelikan, manuscript in preparation).

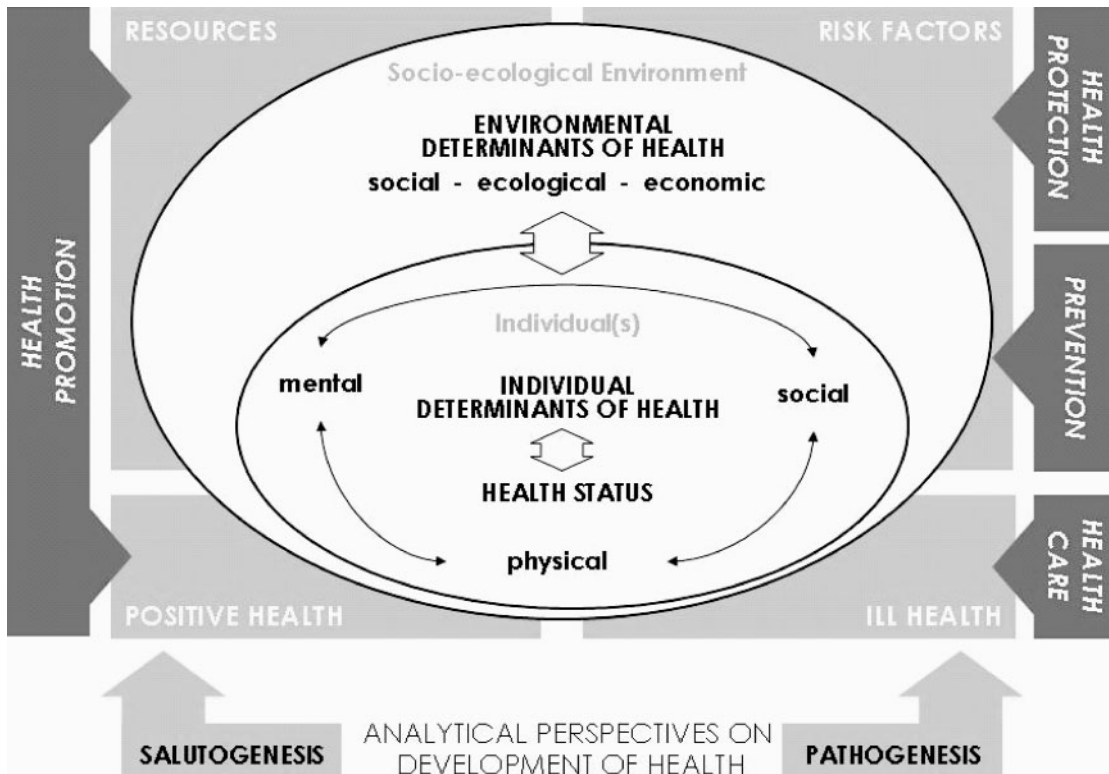
**EUHPID Health Development Model**

Following general systems theory, health development as an integral part of human life, is defined as the ongoing process of (re)producing health through autopoietic self regulation in a given socio-ecological environment. Health as an intended outcome or unintended output of actual living, and, by that, input into or resource for future living, is placed at the centre of the health development model (Figure 1). So we have to accept one of the paradoxes of health, i.e. current health status determines future health, and therefore may be one of the most powerful predictors.

Following the WHO definition (World Health Organization, 1946), the model distinguishes three qualitatively different dimensions of health, i.e. physical, mental and social health. The arrows between these dimensions illustrate that they are highly interdependent. For example, good physical functioning positively influences mental health and supports good social health by facilitating the interaction and communication with others.

Consistent with the three-dimensionality of health, three closely interrelated dimensions of individual determinants of health are distinguished, the physical (e.g. bodily fitness), mental (e.g. sense of coherence) and social dimension (e.g. accessing social support). This distinction allows and forces us to measure and analyse individual determinants of health in a more differentiated way. Looking beyond the individual, health of individual(s) is not created and lived in isolation but results from an ongoing, close interaction with their relevant socio-ecological environment which includes the cultural dimension. As subdimensions of the environmental determinants of health, the social (e.g. density of social networks and cultural diversity), ecological (e.g. ergonomic workplaces) and economic (e.g. equal income distribution) dimensions of sustainability are suggested as established and comprehensible categories in the model (Hardi and Zdan, 1997).

An individual can, depending on his or her capacities, partly influence his or her socio-ecological environment by choice and can try



**Fig. 1:** EUHPID Health Development Model: public health intervention approaches.

to change it. However, it should be considered that persisting inequities in health status in our societies are in large part due to persisting, unequal distribution of these environmental determinants.

Although the health development model builds around the health of individuals, it can be applied as well to aggregates of individuals, such as communities with close social ties or populations with loosely connected members. A healthy community, for example, would consist of healthy individual members, as well as of positive health determinants in their shared, socio-ecological environment—such as high social capital, sense of community, trust, reciprocity and community action to achieve common goals. As in the case of the individual, the immediate socio-ecological environment can be partly shaped by the respective community but partly the community is dependent from the larger socio-ecological context as well. Thus, the health-relevant socio-ecological environment can be analysed and measured on various levels, such as the local, regional, national and global level.

The ongoing processes of health development can be observed, analysed and intentionally influenced from at least two differing but complementary perspectives. Majority of the studies of determinants of health and ill health is set within the pathogenic paradigm (Tones and Green, 2004). A ‘salutogenic model’ to be adopted by health promotion practitioners was proposed by Antonovsky (Antonovsky, 1996), offering salutogenesis as an additional perspective to the pathogenic paradigm (Antonovsky, 1984). Thus, the proposed EUHPID Model distinguishes pathogenesis and salutogenesis as two main analytical perspectives of health development in the fields of public health, health promotion and health care.

Pathogenesis analyses how risk factors of individuals and their environment lead to ill health. Ill health includes disease, objective disorders, subjective sickness, malfunctioning and impairment. Correspondingly, salutogenesis examines how resources in human life support development towards positive health. Positive health includes objective fitness, subjective well-being, optimal functioning, meaningful life and positive quality of life (Raphael *et al.*, 1996).

In real life, salutogenesis and pathogenesis are simultaneous, complementary and interacting real life processes. Living systems such as human beings have to (re)produce their health

continuously in time, making use of resources to maintain their identity against risk factors. An individual can experience positive (e.g. well-being) and negative aspects of health (e.g. chronic disease) at the same time. Further, risk factors such as high environmental noise levels can impede salutogenic processes. On the other hand, resources such as social support can minimize the health impact of risk factors or help recover from disease. Finally, the relative weight of salutogenic and pathogenic structures and processes will vary over the life cycle.

Considering the purpose of arriving at distinct categories of public health indicators, the shaded part of the model in Figure 1 presents salutogenesis and pathogenesis as two analytically separate, but complementary perspectives of ongoing health development.

### **Application of the health development model: relating health promotion and other public health interventions**

Influencing health development is the joint concern of both health promotion and the larger public health field including health care. The health development model is suggested as a common frame of reference to show the primary starting points and related emphases of the respective intervention approaches.

Health promotion primarily supports salutogenic health development by increasing resources which allow better maintenance and enhancement of positive health. Prevention of ill health, health protection and health care start from elements of pathogenic risk factors of health development. Health care, including cure and rehabilitation, is triggered by disease and aims at restoring previously held health status, or at least reducing negative health effects in case of palliative care. Certainly, any healing process supported by health care builds on health resources and thus has to support salutogenic elements as well.

Prevention is mainly dealing with specific risk factors on the individual level (e.g. smoking cessation). Health protection is offering resources for safeguards from both specific (e.g. noise and second hand smoke) and unspecific (e.g. traffic accidents and food contamination) risk factors in the socio-ecological environment. Both primarily prevent or reduce possibilities of pathogenic health development towards disease but they can contribute to positive health development

**Table 1:** Classes and categories of public health indicators based on the health development model

Levels of health development	Elements of health development (three classes of indicators) Subdimensions (three subcategories per class)	Salutogenic and pathogenic analytical perspective (two subcategories per class)
Individual(s)	Health Physical Mental Social	Positive health Ill health
Individual(s)	Individual determinants of health Physical Mental Social	Resources Risk factors
Socio-ecological environment	Environmental determinants of health  Ecological Economic Social	Resources Risk factors

as well. Regardless of this analytical, theoretical classification, in practice all these approaches overlap, complement each other and are often implemented in combination.

Different public health intervention approaches all target various elements of the health development model, as shown above in Figure 1. Consequently, these elements of the model can be used to define categories of possible public health outcome indicators. Applying a causal, deterministic and health-centred interpretation, the first two categories can be considered as determinants of the third category ‘health outcome’.

Table 1 shows how the three elements of the health development model translate into three main classes of such public health outcome indicators: indicators of health, indicators of individual determinants of health and indicators of environmental determinants of health. All these three levels can be targeted and potentially changed by public health interventions. Also, Table 1 shows how for each of these, classes and subcategories of indicators can be defined by cross-tabulating the subdimensions of the elements of health development with the salutogenic and pathogenic analytical perspective.

The cross-tables result in six categories of indicators of health status, six categories of indicators of individual determinants of health and six categories of indicators of environmental determinants of health (Tables 2–4).

**Table 2:** Categories of health indicators

Subdimensions	Analytical perspectives	
	Positive health	Ill health
Physical	×	×
Mental	×	×
Social	×	×

**Table 3:** Categories of indicators of individual determinants of health

Subdimensions	Analytical perspectives	
	Resources	Risk factors
Physical	×	×
Mental	×	×
Social	×	×

**Table 4:** Categories of indicators of environmental determinants of health

Subdimensions	Analytical perspectives	
	Resources	Risk factors
Ecological	×	×
Economic	×	×
Social	×	×

Although all these categories are clearly defined by the underlying model, the selection and assignment of single indicators to these categories will depend on the interpretation by various users and professional fields. For example, the fitness industry might emphasize physical fitness as a core health outcome. For the medical field, physical fitness might just be one individual, physical determinant of health contributing to health outcomes, such as reduced cardiovascular morbidity and mortality rates. Also, indicators of socio-economic status such as gender or income could be assigned to the physical, mental or social dimension, depending on which aspect of the underlying construct is to be emphasized.

In addition to these general classes of public health/health promotion outcome indicators, for each public health/health promotion intervention approach specific classes of process indicators need to be developed in the future which reflect the respective strategies used to influence ongoing health development. As will be explained in detail in a forthcoming article (G. Bauer, J.K. Davies, J. Pelikan, manuscript in preparation), in case of health promotion such process indicators will have to cover the



following elements of the health promotion approach in order to monitor and improve health promotion practice:

- Building on existing health promotion infrastructure;
- Following a systematic public health action cycle (US National Academy of Sciences, 1988) which first identifies leverage points in health development to be addressed by health promotion interventions;
- Combining the five action areas defined in the Ottawa Charter (World Health Organization, 1986) appropriately; and
- Building on the seven core health promotion principles defined by an international WHO expert group (Rootman *et al.*, 2001).

## CONCLUSIONS

The EUHPID Health Development Model provides the theoretical basis for a planning tool to identify, implement and assess appropriate launch points for various public health intervention strategies and methods related to both pathogenic and salutogenic approaches. Further investment in understanding interventions into the health development process is needed by initiating and analysing a range of practical case studies of health promotion and related public health interventions.

The EUHPID Model offers a common frame of reference and classification system for monitoring a range of public health and health promotion interventions. This classification system has been applied to the current ECHI shortlist and demonstrated that the list focuses largely on pathogenic and individual level health development as well as on the health care system. This is in contrast to estimates that ~20% of gain in life expectancy during the 20th century in the United States, for example, is due to improvements in the health care system (Bunker *et al.*, 1994) leaving the remaining 80% to changes of lifestyles and particularly to changes in the socio-ecological environment (McKeown, 1979). It will be a future task for the new ECHI Monitoring (ECHIM) Project and a currently planned second phase of the EUHPID Project to develop complementary indicators which emphasize salutogenic health development in everyday life. Such indicators would consider important, increasingly researched individual and environmental resources of health such as social capital

(Health Development Agency, 2004), sense of community (Sense of Community Partners, 2004), health capacities (Hawe *et al.*, 2000), health literacy (Kickbusch, 2002) and sense of coherence (Antonovsky, 1996).

Such an expanded list of public health outcome indicators would contribute to a more balanced perspective of health and of its determinants and could trigger more investment in supporting salutogenic health development by health promotion and related fields. A companion paper in preparation by the present authors (G. Bauer, J.K. Davies, J. Pelikan, manuscript in preparation) will present the EUHPID Health Promotion Model as a basis for developing matching process indicators for monitoring and improving such interventions.

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## REFERENCES

- Antonovsky, A. (1984) The sense of coherence as a determinant of health. In Matarazzo, J. *et al.* (eds) *Behavioural Health: A Handbook of Health Enhancement and Disease Prevention*. John Wiley, NY, pp. 114–129.
- Antonovsky, A. (1996) The salutogenic model as a theory to guide health promotion. *Health Promotion International*, **11**, 11–18.

- Bauer, G., Davies, J. K., Pelikan, J., Noack, H., Broesskamp, U. and Hill, C. (2003) Advancing a theoretical model for public health and health promotion indicator development. *European Journal of Public Health*, **13**, 107–113.
- Bunker, J. P., Frazier, H. S. and Mosteller, F. (1994) Improving health: measuring the effects of medical care. *Milbank Quarterly*, **72**, 225–258.
- Dahlgren, G. and Whitehead, M. (1991) *Policies and Strategies to Promote Social Equity in Health*. Institute of Futures Studies, Stockholm.
- Davies, J. K., Sanchez, B., Tzimoula, X. and Linwood, E. (2002) *The Development of a European Health Promotion Monitoring System (the EUHPID Project): Interim Report to the European Commission, DG SANCO on behalf of the EUHPID Consortium*. International Health Development Research Centre, University of Brighton, Brighton.
- Davies, J. K., Hall, C. and Linwood, E. (2004) *The Development of a European Health Promotion Monitoring System (The EUHPID Project): Final Report to the European Commission, DG SANCO on behalf of the EUHPID Consortium*. International Health Development Research Centre, University of Brighton, Brighton.
- European Community (2004) Available at: [http://europa.eu.int/comm/health/ph\\_information/indicators](http://europa.eu.int/comm/health/ph_information/indicators).
- Green, L., Simons-Morton, D. G. and Potvin, L. (1997) Education and lifestyle determinants of health and disease. In Detels, R., Holland, W. W., McEwen, J. and Omenn, G. S. (eds), *Oxford Textbook of Public Health*. 3rd edition, Volume 1. Oxford University Press, Oxford.
- Hardi, P. and Zdan, T. (1997) *Assessing Sustainable Development: Principles in Practice*. International Institute for Sustainable Development, Winnipeg.
- Hawe, P., Noort, M., Jordens, C. and Lloyd, B. (2000) *Indicators to Help with Capacity Building*. Australian Centre for Health Promotion, New South Wales.
- Health Development Agency (2004) Social capital and health Available at: [www.social-action.org.uk/hdaresearch/research.asp](http://www.social-action.org.uk/hdaresearch/research.asp).
- Kickbusch, I. (2002) Health literacy: the search for new categories. *Health Promotion International*, **17**.
- Kramers, P. (2003) The ECHI project: health indicators for the European Community. *European Journal of Public Health*, **13**, 101–106.
- Lalonde, M. (1974) *A New Perspective on the Health of Canadians*. Ministry of National Health and Welfare, Ottawa.
- McKeown, T. (1979) *The Role of Medicine: Dream, Mirage or Nemesis?* Blackwell, Oxford.
- Moliner, A. M. (2004) *What Should be Measured in Relation to Health Status: The EU Aggregate Experience*. EC/WHO/EUROSTAT Meeting, European Commission, Geneva.
- Raphael, D., Renwick, R., Brown, I. and Rootman, I. (1996) Quality of life indicators and health: current status and emerging conceptions. *Social Indicators Research*, **39**, 65–88.
- Rootman, I. et al. (2001) *Evaluation in Health Promotion: Principles and Perspectives*. World Health Organization, Copenhagen.
- Sense of Community Partners (2004) *Exploring Sense of Community: An Annotated Bibliography*. Sense of Community Partners, Calgary.
- Tones, K and Green, J. (2004) *Health Promotion: Planning and Strategies*. Sage, London.
- US National Academy of Sciences (1998) *The Future of Public Health*. National Academies Press, Washington, DC.
- World Health Organization (1946) *Constitution of the World Health Organization*. WHO, Geneva.
- World Health Organization (1986) *The Ottawa Charter for Health Promotion*. WHO, Copenhagen.