Developing indicators to enhance school health

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Abstract

There are many indicators used to assess the processes and outcomes of school health promotion and education programs and initiatives. This paper examines the development of such indicators, and the different foci on the biological, behavioral, social and contextual aspects of child and adolescent health measures. It then develops a framework for categorizing them. The variety of stakeholders who have an interest in school health is identified. A matrix is developed which maps the levels of influence the different stakeholders have in the categories of indicators. The paper concludes by delineating a set of criteria designed to assist stakeholders to be more strategic in identifying realistic and practical indicators which will provide useful information in judging their inputs and improving their contribution to school health promotion and education.

Indicators and health

Data are collected on young people as soon as they are born and this continues throughout childhood and adolescence. Measures about body weight, height, dietary behavior and crying behavior provide health care professionals with information to monitor and assess a baby’s health. As the child ages, population measures in areas such as immunization rates, infectious disease incidences and the prevention of injuries are used to shape public health interventions which are directed at specific groups, e.g. parents, manufacturers, road users and young people themselves. There are many indicators which exist in the biological and behavioral domains (e.g. body mass index, motor skills, nutritional practices and sun protective behaviors) which provide evidence of the health status of young people and the populations of which they are part. International studies such as Health Behaviors in School Children (HBSC) have collected data on numerous health indicators from 10–15 year olds from a number of nations over many years and have provided invaluable longitudinal data on young people’s health behaviors which can be compared across countries (Wold et al., 1994). A considerable bank of health indicators for young people has been established.

Indicators have become important in understanding the objectives, processes and outcomes of both the health and education sectors, and their many components. McCall [(McCall, 1996), p. 37] claims there are data that ‘...describes an activity, condition or feature of a system, and which are often regularly collected by government, institutions and agencies to report on the impact of their systems’. In health promotion and health education they provide us with information on which to base decisions and judgments about resource allocations, policy, awareness raising, the efficiency, effectiveness and feasibility of particular interventions and programs, and about ‘best practice’. Yet there is considerable debate in the literature about the purpose of indicators. Labonte et al. (Labonte...
et al., 1997) discovered a plethora of indicators in use in health promotion and health education activities, but found they rarely involved the input of people targeted by health promotion and health education interventions. Whelan et al. (Whelan et al., 1993) suggested indicators provide considerable information, but the significant influence of the Financial Management field tends to skew their applications toward quantitative measures of ‘value for money’. As such, indicators appear to be of particular use to those who provide funds.

In a significant work sponsored by WHO in the late 1980s, Kar and Berkanovic (Kar and Berkanovic, 1987) developed a conceptual framework for delineating and mapping the indicators used in health promotion. They found that most of the indicators reported in the literature in the health promotion area focused on aspects of individual physical health (e.g. specific behaviors) and quantitative measures of health status. They noted that indicators which unravelled societal dimensions of health, e.g. social capital, connectedness (Resnick et al. 1993) and which were qualitative in nature, were rarely used. The number of indicators derived from the bio-medical perspective far outweighs those emanating from the ‘new public health’ paradigm where a more holistic approach to health is taken. For instance, a recent study in Western Australia showed health sector agencies reported on nearly 1000 indicators with the vast majority being about access and efficiency in acute care (West Australian Government, 1999).

Kar (Kar, 1989) claims the emergence of the ‘new public health’ (Ashton, 1988; Kickbusch, 1989) in the last two decades has begun to shift the horizons of health care in a number of different directions, i.e. from patients in clinics to communities in different settings, from treatment and care to primary prevention, and from patient compliance to community participation. These changes have created a climate where the social, behavioral, environmental and biological sciences have converged in shaping health promotion and health education interventions. Consequently, a new and broader set of indicators has had to be developed to accommodate new perspectives. The development of such indicators has been supported by many government and international organizations, including WHO.

The work of Raphael and his colleagues in Canada on developing indicators which seek to illuminate ‘quality of life’ aspects is illustrative of the different elements which contribute to the health of a person, their community and society (Raphael et al. 1996). Recently there has been considerable work internationally to define, describe and explain health indicators of a qualitative nature, which, like the well-developed biologically based quantitative indicators, can be used to both understand health promotion interventions, and to develop appropriate infrastructures and policies to improve individual and community health (Cummins, 1996; Macdonald, 1997; Zubrick et al., 1999). These and other researchers are now identifying indicators which provide us with knowledge and understanding in a variety of fields which affect health, e.g. social and family functioning, resiliency, isolation, housing quality, social connectedness, self-esteem, and employment.

**Health indicators and young people**

Nutbeam (Nutbeam, 1997) has identified a framework for assessing the health of young people and with it provided an integrated model where the qualitative aspects are clearly articulated and indicators of supportive environments for young people are explored. He suggested a three-stage hierarchy, i.e. health and social outcomes (including quality of life and morbidity and mortality), intermediate health outcomes (including healthy lifestyles, effective health services and healthy environment) and health promotion outcomes (including health literacy, social influence and action, and healthy public policy). The growth in, and understanding of, social indicators has enabled local communities and governments to be more involved in shaping and implementing health promotion interventions. This was demonstrated in...
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the work of Kalnins and her colleagues in Canada where primary school children played a major role in a community drug reduction strategy (Kalnins et al., 1994). Here the indicators of the school health promotion intervention were concerned with advocacy, empowerment, critical thinking and decision making. Indicators in these areas are beginning to provide those involved in school health promotion and education initiatives with a better understanding of the factors which influence a young person’s health capacity and status. There now appears to be more attention given to developing school health programs which focus on enhancing the coping skills of students (Weare and Gray, 1994; WHO, 1994).

The work in the last decade on resilience in young people is a case study of how health has moved from relying solely on morbidity and mortality measures, to helping and working with particular age groups such as youth to identify measures and use indicators to develop policies and programs which enrich young people’s health (Raphael, 1993; Resnick et al., 1993; Hawkins et al., 1994, O’Donnell et al., 1995). Kolbe et al. (Kolbe et al., 1997) claim there are at least 70 health behaviors which significantly influence the health of young people, e.g. physical activity, diet, drug use, relationships, etc. They make a plea for indicators which measure such behaviors in young people to be disseminated, debated and acknowledged by the health, welfare and education sectors as they set their priorities and allocate resources. There now appears to be a wider acceptance by those involved in young people’s health about the value of using a range of indicators from both the traditional domains, e.g. biological and behavioral, and the emerging areas, e.g. quality of life, to shape health promotion and health education interventions.

Health indicators and schools

There has been confusion about what indicators are appropriate to school health promotion and education programs and initiatives. Traditionally, the health sector has invested significant resources in schools to address particular issues, e.g. tobacco use, nutrition, STDs, etc. The sector has viewed schools as settings where one can easily reach a particular population group to influence behavioral outcomes (US Department of Health and Human Services, 1991; WHO, 1992; NHMRC, 1996). The indicators for the health sector have largely been related to measures of health status and health-related behaviors (NHMRC, 1996; WHO, 1996a; St Leger and Nutbeam, 1999). The education sector, on the other hand, has traditionally viewed school health as part of a number of key learning areas (Brunn-Jensen, 1994; St Leger, 1999). Its indicators of health promotion and health education outcomes have usually focussed on knowledge acquisition, understanding and particular cognitive skills, e.g. analysis, synthesis.

Recently, there have been a number of international attempts to bring the relevant indicators from the health and education sectors more closely together, and to articulate a set of indicators which are more comprehensive and which will provide information for a variety of stakeholders to make judgements and decisions (Baric, 1994; WHO, 1996a; St Leger and Nutbeam, 1999). Particular initiatives have occurred in the European Network of Health Promoting Schools (ENHPS) and in North America. Promising work has recently begun in the Western Pacific Region of WHO.

The WHO Expert Committee on Comprehensive School Health Education and Promotion identified five types of indicators which reflected integration between the priorities of both the health and education sectors. These indicators were one of a number of outcomes of intensive international collaboration over 2 years in the mid-1990s. A series of workshops in the five WHO regions provided ideas to the Expert Committee which also invited 32 leaders in school health to develop background papers. The five types of indicators identified were (WHO, 1996c):

- Children’s health status, e.g. height for age, total calorie intake.
- Learning ability, attendance and learning
achievement, e.g. literacy and numeracy skills, basic learning competencies.

- Behaviors affecting health, e.g. tobacco use, physical activity.
- Quality of the physical and psychosocial health environment, e.g. water and sanitation quality, policies and practices in schools.
- School health program implementation, e.g. curriculum, access to health services, links with the local school community.

The Committee in its report claimed that in a number of areas, the work done on identifying indicators and reporting on them has been comprehensive, e.g. physical environment indicators, height for age, weight for age, learning achievement, and health risk and health enhancing behaviors. However, they make a strong argument for more research into developing clear indicators around the learning ability of students, the psychosocial aspects of a school’s environment, and on dissemination and implementation of school health programs in particular. They also commented on teachers as important stakeholders in school health ‘...the development of indicators to assess the health status, professional development, and satisfaction of teachers is extremely limited and should be a priority for research’ [WHO, 1996c, p. 18]. The recognition of the role teachers play in developing and implementing school health programmes, and the supporting resources and services for them to effectively undertake their tasks, has received very little attention in the literature. However, in the latter part of the 1990s, it was evident that countries and agencies were recognizing the significance of the teacher in school health and many capacity-building initiatives were being undertaken (NHMRC, 1996; St Leger and Nutbeam, 1999; Weare, 2000). However, few programs had actually addressed the necessary indicators to understand these initiatives.

Work to bring the health and education sectors closer and to develop useful indicators has begun within the health-promoting school movements, particularly in Europe, the Western Pacific and North America (American Cancer Society, 1993; McDonald and Ziglio 1994; WHO, 1996a). However, it appears little attention has been given to identifying not only the key stakeholders in school health promotion and education programs, but also, the relative importance of these stakeholders in contributing to both the development of indicators, their measurement and use of such measures.

### The stakeholders in school health

There are many stakeholders who are involved in school health programs. These can be grouped around school-based and sector-based categories.

Table I identifies the diversity of stakeholders in the school-based and health and education sectors.

There is considerable evidence in the literature of the influence in the last two decades of the health sector in shaping the breadth and depth of indicators used in school health programs [e.g. (US Department of Health and Human Services, 1991; American Cancer Society, 1993; World Bank, 1993; NHMRC, 1996; WHO, 1996a,b)]. This is not surprising given the resources that have been invested in such programs by the health sector. What is surprising, is the apparent acquiescence of the education sector to this situation. There has been little attempt by the education sector to negotiate shared indicators with health (Allensworth, 1993; NHMRC, 1996; WHO, 1996b; Nutbeam, 1997). Rather, educationally based indicators have largely been developed in isolation to those generated by the health sector for the same programs. They have usually reflected the core business of schooling, i.e. to improve the knowledge and skills of young people, and have been couched in terms of ‘gain an understanding of’, ‘be able to analyse’. Many school health initiatives have been largely resourced by the health sector around current societal health issues, e.g. drugs, HIV/AIDS, which has meant that school-based personnel have probably accepted the biomedical indicators as being appropriate. That many are amenable to measurement and are grounded in recognized international data collection and interpretation methodologies has also enhanced their legitimacy. The school-based

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Table I. Stakeholders in school health

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<th>Stakeholders in school health</th>
<th>Health sector</th>
<th>Education sector</th>
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<td>Students</td>
<td>Government (local/state/national)</td>
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<td>Teachers</td>
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<td>Support personnel, e.g. nurses, counselors</td>
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<td>Parents</td>
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stakeholders have generally not been involved in developing indicators which reflect their commitment to, and participation in, school-based health promotion programs in areas such as nutrition, physical activity, mental health, drugs and sexuality. This has reinforced the notion that school health, whilst implemented by schools, is done on schools by external health agencies. Clearly the various stakeholders in school health need to play a more collaborative role in developing indicators which reflect both the health and educational objectives of the programs.

A matrix (Table II) has been developed to portray the relative influence by the stakeholders in determining the type of indicators used in school health in order to facilitate better collaboration between stakeholders. The five categories of indicators proposed by WHO have been used.

The purpose of the matrix is to understand the comparative involvement of the different stakeholders and to enable stakeholders to be more strategic in choosing indicators which provide useful information to improve the quality of school health initiatives. Each cell in the matrix has been ascribed a 0–5 star system. The weighting of the stars is based on the author’s interpretations about the different influences. These interpretations are derived from a review of outcomes from over 600 articles of relevant studies, including a number of meta-analyses, combined with experiences of the author in working in schools, health and education systems, and research settings. All 600 articles have been summarized and the different stakeholders involved identified. From this data, a subjective assessment was made on the relative influence of the various stakeholders in the selection of school health indicators.

There are a number of trends and themes which appear when the whole table is examined. These are discussed in the next section.

The focus of school health indicators

Three main trends emerge from Table II.

- The consistent concentration by schools on the five indicator fields.
- The strong emphasis by the health sector on health status and health behavior related indicators.
- The marked differences between the health and education/school sectors in using indicators in the learning and environment fields.

There are comparatively few studies in the school health promotion and education literature which have reported on a breadth of indicators. Those that do so, show indicators are used which portray the five fields in Table II (Went, 1992; Cameron and McBride, 1995). Many of these programs have been funded by the health sector, yet the education sector, and schools in particular, have played a significant role in interpreting and shaping the programs. Also, the programs have been designed in a way that allows schools increased flexibility, and to take different emphases and directions in how they address the curriculum, partnerships with the local community and what school-based health-related policies they develop. The programs are also characterized by a reduced focus on centrally developed classroom-based curriculum materials.
Most of these studies which report on a breadth of indicators adopt the health-promoting school framework which has been promoted by WHO and which emerged in Europe in the late 1980s (Nutbeam, 1992; McDonald and Ziglio, 1994). A similar approach to school health also occurred in the 1980s in the USA—comprehensive school health education (Kolbe, 1986). School programs which follow the health-promoting school approach tend to use indicators from all five categories.

The history of school health which includes school health education and promotion and the provision of school health services for most of the 20th Century has been based on the understanding that schools were sites where particular populations or sub-populations (e.g. adolescents, girls, ‘at-risk’ groups) could be targeted for interventions which were designed to improve health status and/or change health-risk behaviors (WHO, 1996b). The indicators used for such programs have reflected this emphasis. Recently, another focus has been added to school health initiatives to build protective behaviors and resilience in young people (Nutbeam et al., 1993; Resnick et al., 1993). Here indicators in the environmental area and learning fields are playing an increasing role in helping us understand how interventions work and how they can be improved.

The health sector has had reasonable success with particular interventions in the standard topic areas—nutrition, sexuality, drugs, physical activity. The literature shows that successful programs in these areas are usually characterized by a combined focus on behavior change; cognitive and social outcomes; sustainability over several years with an adequate resource base; a ‘holistic’ and integrated approach which links schools with relevant agencies and groups; and the allocation of substan-

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<th>Children’s health status</th>
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Invest resources to building the capacity of teachers and other school-based personnel, e.g. nurses, to be more effective (St Leger and Nutbeam, 1999). Programs which meet these criteria generally use indicators from the five categories to portray their processes and outcomes.

Whilst there have been many health sector programs which have seen schools as ‘black box’ sites on which to conduct an intervention, there has been a major shift in the last decade in how the health sector is approaching school health. The literature has demonstrated an increasing number of programs which enable schools to take more ownership in facilitating the implementation of the school health program, and which seek to report the processes and outcomes in areas in addition to health status and health-related behaviors (Smith et al., 1992; Allensworth, 1993; NHMRC, 1993; McDonald and Ziglio, 1994; Peters and Paulussen, 1994; WHO, 1996b). The work undertaken by WHO in the Life Skills and Mental Health fields and accompanied by many exciting programs in different countries is demonstrating how the health and education sectors can collaborate to address both the breadth and depth of the school-located factors which influence mental health, i.e. knowledge and skill acquisition, school-based health policies, the schools physical environment, links between the school and local health services, the social environment, and partnerships between the school and its local community including parents. However, indicators in a number of these areas are poorly developed at this stage. This is particularly so where there are few accepted indicators which inform us about aspects of the schools social environment, and how community links and partnerships operate.

**Selecting indicators to assess and improve school health**

The paper concludes by proposing five guidelines to enable stakeholders to choose a manageable set of indicators which will facilitate more accurate judgements of the school health program and which will improve the quality of, and help to sustain, school health programs.

Choose indicators which:

- **Give useful data and add value.** Data collected about school health programs are often difficult to obtain. They rely on careful ethical proposals and approvals which have implications because the subjects may be children and/or adolescents. Data collection is often dependent on the collaboration of school administrators and teachers (and increasingly students and parents) in responding to questionnaires and interviews. The indicators chosen and the data collected to report on such indicators need to respect the time and commitment of the various subjects and sensitivities around the subject matter (e.g. sexuality, drug use). They must therefore make a clear contribution through the eyes of the school-based stakeholders to understanding the program and enriching further activities.

- **Are within the boundaries of influence of the program.** The literature contains a number of meta-analyses and well designed and implemented studies over reasonable time frames such as 3–4 years, which show school health programs have effects on behavior, knowledge and attitudes but these are usually limited by the availability of resources, appropriateness of the theoretical design and professional skills of the teachers (Lavin, 1992; Peters and Paulussen, 1994; WHO, 1996b; St Leger and Nutbeam, 1999). Unfortunately in many school health studies indicators are chosen for measurement where the resources and time commitment of the program means it is unlikely that any effect will be observed, e.g. expecting behavior changes after a 4-week classroom-focussed nutritional intervention. The indicators, both in number and complexity, need to reflect the size and scope of the program.

- **Add to knowledge and understanding about how the program is implemented.** We know very little about what happens during the implementation of the school health programs compared to the information we have from indicators on health status and health
behaviors. The educational research literature on curriculum implementation, school organization, and teacher professional development and management is rarely accessed in shaping school health interventions. (St Leger and Nutbeam, 2000). Similarly, the psychological literature on child and adolescent learning needs to be accessed more, although a number of the major school health programs in North America and some European countries have acknowledged this (Samdal et al., 1998; Smith et al., 1999).

A select number of appropriate indicators about teacher collaboration, innovation dissemination and adoption should be drawn from the education literature, and used to increase our knowledge and understanding about how the programs are implemented.

*Involve the key stakeholders in their development.* Currently there are few of the various stakeholders in Table I who participate in developing school health indicators. The external funding of programs has encouraged such agencies to develop their own measures. There are two compelling reasons why school-based stakeholders should be involved. Students, teachers and administrators, and other school-based personnel, e.g. school nurses and counselors, have wisdom, insights and experiences about how schools operate and what might be reasonably expected as achievable outcomes. There is also a moral dimension where the rhetoric of the ‘New Public Health’, and the various discourses on community empowerment and participation, and the commitments of the education sector to building citizenship and democratic competencies in young people, needs to be reflected in how school health programs are planned, implemented and evaluated.

*Represent the five fields.* It is these fields which portray the richness in depth and breadth of health. No program can be expected to cover indicators in all five fields with equal intensity. The WHO Expert Committee reminds us ‘it is important not to elevate indicators and objectives in and of themselves’ [(WHO, 1996c), p. 9]. However, as demonstrated by the increasing number of exemplary school health programs, indicators can be collected from all five areas with appropriate emphases to inform us about outcomes, to make judgements about process, to shape the next developments, and contribute to the sustainability of quality practices and products.

**Conclusion**

There is an encouraging shift in sophistication in the way school health programs are designed, delivered and evaluated. An increasing number of studies from many countries show closer collaboration between the health and education sectors in planning school health. However, both sectors need to continue this collaboration by articulating more clearly the range and variety of indicators which are appropriate to gain information about the programs and their results. This needs to involve the school-based stakeholders more as partners in shaping such indicators. Then, we may have clearer and acceptable indicators which are jointly owned by the stakeholders in the health and educator sector, and in the schools themselves—indicators which will enhance the quality of school health and provide a pragmatic framework for reporting its outcomes.

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