

# Global Overview of School Health Services: Data from 102 Countries

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**Objective:** The objective of this paper was to produce a global inventory of school health services and describe characteristics such as target group, providers, staffing level, services, settings, and organizational challenges. **Methods:** The literature in PubMed and other sources were reviewed using an explicit methodology. **Results:** School health services exist in at least 102 countries. Usually services are provided within school premises (97 countries), by dedicated school health personnel (59 countries). Services are provided in 16 areas; the top 5 interventions include vaccinations, sexual and reproductive health education, vision screening, nutrition screening, and nutrition health education. **Conclusions:** Important areas such as mental health, injury and violence prevention may not be given sufficient consideration in routine service provision. We advance several recommendations for research, policy, and practice.

**Key words:** school health services; school health; adolescent health  
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In May 2014, the World Health Organization (WHO) released global estimates of mortality and morbidity in adolescents.<sup>1</sup> Estimates suggest that although mortality rates are low in adolescents compared with other age groups, adolescents have significant needs for health services. The leading causes of death among 10-14 year-olds are human immunodeficiency virus (HIV), diarrheal diseases, road injuries, lower respiratory infections, and drowning. Among older adolescents, 15-19 years old, the top 5 causes of deaths in 2012 were road injury, suicide, interpersonal violence, HIV and lower respiratory infections. Globally, maternal causes rank number 2 among causes of mortality in 15-19 year-old adolescent girls.<sup>1</sup> Due to the successes of the antiretroviral therapy more children than ever with HIV survive into adolescence; today more than 2 million adolescents are living with HIV. However, although the overall number of HIV-related deaths is down in all age groups, estimates suggest that HIV deaths among

adolescents are rising.<sup>2</sup> The major causes of disability-adjusted life years lost in 10-19 year-olds are depression, road injuries, iron deficiency anaemia, HIV, and suicide.<sup>1</sup> In any given year, about 20% of adolescents experience a mental health problem, most commonly depression or anxiety. Depression is the top cause of illness and disability among adolescents and suicide is the third cause of death; among 15-19 year-old girls suicide is the number one cause of death globally.<sup>2</sup>

All these are largely preventable causes and the WHO report *Health for the World's Adolescents – A Second Chance in a Second Decade* argues that to make progress toward universal health coverage for 1.2 billion adolescents in the world, we need to transform how health systems respond to their health needs.<sup>1</sup> A system of school health services is, perhaps, the only institution that reaches the majority of adolescents on almost a daily basis, and is particularly well placed to reach adolescents with preventive interventions. In 2012, the primary

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## Box 1 Definitions Used in this Paper

### **School health services**

Health services provided to enrolled students by health care and/or allied professional(s), irrespective of the site of service provision; the services should be mandated by a formal arrangement between the educational institution and the provider health care organization.

### **School health provider**

Health or allied professional that are involved in the provision of school health services.

### **Dedicated school health provider**

Health or allied professional that is involved *only* in school health services provision (does not serve other population groups), irrespective of the site where services are provided.

### **School-based health services**

School health services that are provided in school premises; services can be provided by health care provider(s) located on-site, or visiting, or both.

gross school enrolment ratio was 108.4% (global average); the secondary gross school enrolment ratio was 73% (global average).<sup>3</sup> Importantly, in many countries the trends for both indicators are positive.

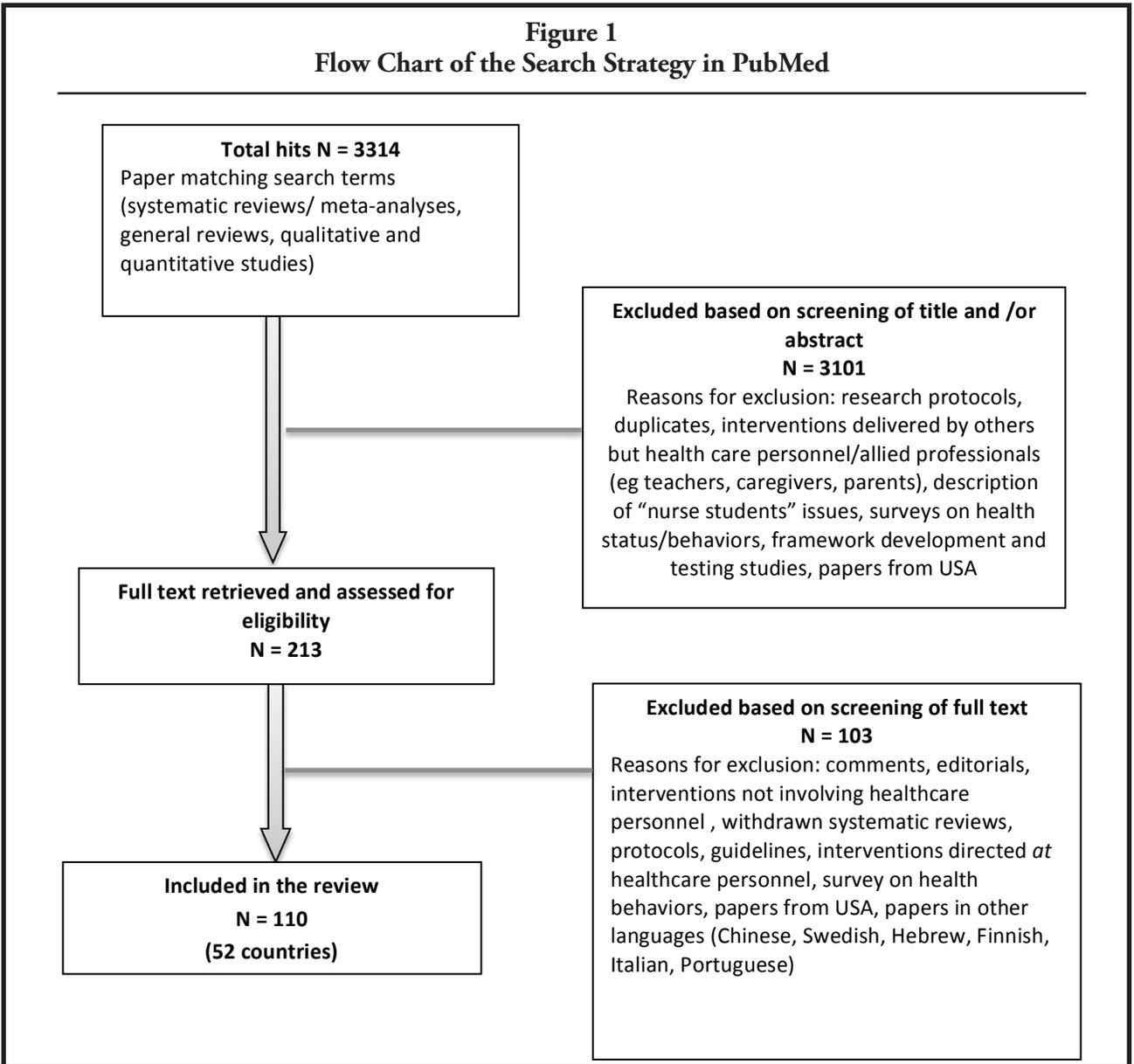
However, among the scientific and political advances that adolescent health agenda witnessed during the last few years,<sup>4-10</sup> the role of school health services has not been adequately addressed. There is little reflection in the literature and in the global health policy discourse about school health services' contribution to adolescent health and development priorities. The variability of school health services organization in countries and lack of information regarding school health services practices makes cross-country experience sharing, and critical reflections upon practice difficult.

This study aims to fill this gap. Its objective is to offer a global inventory of school health services organization in countries and describe their characteristics such as target group, providers, staffing level, services, settings, and organizational challenges. The paper aims to provide decision makers, researchers, and other stakeholders with a basis for reflection on how the effectiveness and responsiveness of school health services to aforementioned health and development priorities can be improved.

## **METHODS**

For this paper we used the definitions provided in Box 1. We conducted a literature search and selection of articles to identify papers that described services provided to school students of any age by healthcare personnel and/or allied professionals. We searched PubMed using a standardized search strategy. To avoid analysis of an overwhelming number of articles from the United States (US) that were likely to describe similar features of school health services, the PubMed search strategy was designed to exclude US papers. We subsequently hand-searched recent US sources that described school health services, and included them in the analysis.<sup>11-13</sup> In addition, we used the Google search engine for on-line sources containing information on countries that were not identified through the PubMed search. Finally, we included in the analysis sources of grey literature available to us such as national policy documents<sup>14-17</sup> and completed questionnaires from Barbados, Costa Rica, Singapore, and the Republic of Korea that were used to inform the section on school health services of the WHO report *Health for the World's Adolescents – A Second Chance in a Second Decade*.

**Figure 1**  
**Flow Chart of the Search Strategy in PubMed**



**Selection Process and Criteria**

We identified sources for appraisal in 3 steps. In the first step we searched in PubMed using a 2-stage process to select papers. In the first stage we scanned titles and abstracts, and applied inclusion and exclusion criteria. We limited our review to peer-reviewed articles published in PubMed during 2004-2013 in English, French, Russian, and Spanish languages. Eligible papers were those that, irrespective of their primary purpose, mentioned any kind of healthcare personnel and/or allied professionals providing services to students. We excluded studies that described school based

programs in which the intervention or service was delivered by other professionals (eg, teachers, peer educators, parents) who are not healthcare personnel or allied professionals, as well as papers such as position statements that did not mention details of personnel or services provided.

As Figure 1 illustrates, the PubMed search generated 3314 papers. To ensure inter-reviewer reliability, 2 persons reviewed titles and abstracts to assess eligibility of papers. This screening eliminated 3101 items (articles were from the US, descriptive reports, position statements, and papers in other languages). We reviewed the remaining 213 articles

**Table 1**  
**Countries and Territories Represented in the Review, by Income Level<sup>46</sup>**

World Bank categories	Countries and Territories <sup>a</sup>
High-income economies	Aruba, Australia, Austria, Bahamas, Barbados, Belgium, Bermuda, Canada, Chile, China (Hong Kong), Croatia, Cyprus, Denmark, Estonia, Finland, France, Greece, Iceland, Ireland, Israel, Italy, Japan, Kuwait, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Netherland Antilles, New Zealand, Norway, Oman, Poland, Portugal, Qatar, Republic of Korea, Russian Federation, Saint Kitts and Nevis, Saudi Arabia, Singapore, Slovenia, Spain, Sweden, Switzerland, Trinidad and Tobago, United Kingdom, United States of America
Upper-middle-income economies	Albania, Argentina, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, China, Costa Rica, Cuba, Dominican Republic, Former Yugoslav Republic of Macedonia, Grenada, Hungary, Iran (Islamic Republic of), Iraq, Kazakhstan, Malaysia, Mexico, Panama, Peru, Romania, South Africa, Saint Lucia, Saint Vincent and the Grenadines, Thailand, Tunisia
Lower-middle-income economies	Armenia, Cote d'Ivoire, Egypt, El Salvador, Georgia, Guyana, Honduras, India, Morocco, Nicaragua, Nigeria, Pakistan, Palestine (West Bank and Gaza), Paraguay, Philippines, Republic of Moldova, Senegal, Timor-Leste, Ukraine
Low-income economies	Burkina Faso, Kenya, Malawi, Nepal, United Republic of Tanzania, Tajikistan, Togo, Uganda, Zimbabwe

**Note.**

**a = Including Netherlands constituent country Aruba, the former Netherland Antilles, West Bank and Gaza; hereafter we use the term “countries” to indicate “countries and territories.”**

in full and applied our inclusion and exclusion criteria. We discussed discrepancies in selections until we reached consensus. Our final review in PubMed comprised 110 articles.

In the second step, we hand-searched using the Google search engine for key words such as school health/school health services plus the country name for the countries that were not captured in the PubMed search. We identified an additional 27 sources, including 16 papers,<sup>11,12,18-31</sup> 7 reports<sup>13,32-37</sup> and 4 Web-pages.<sup>38-41</sup> In the third step we added 8 sources from grey literature available to us.<sup>14-17,42-45</sup> Our final review was comprised of 145 sources.

### Data Extraction and Analysis

We recorded detailed information about each study to identify characteristics of school health services. We developed a data extraction form to collect information on source title, author, publication date, paper main objective, and whether or not the source described routine service provision or a project/experiment. The main categories and characteristics analysed included: (1) *target group* – age and other characteristics such as sex or school grade found in the literature to define the target group for school health services; (2) *provider(s)* –

profession, location (school-based, or visiting, or not specified), dedicated school health provider or not; (3) *normative staffing level* – indicators to express normative staffing level, and their values; (4) *service area* - mental health, sexual and reproductive health, dental health, infectious diseases, hearing, vision, nutrition, chronic illnesses, orthopaedics, substance use, violence, emergency care, endocrinology, neurology, muscular-skeletal disorders, other services, or not specified; (5) *type of services* - screening, education/promotion, counseling, health referrals, vaccinations, drug provision/treatment, support or not specified; (6) *setting* – school based provision, or off-site; and (7) *organizational challenges* - human resource issues, finance, coordination, community support, policies, equity, not mentioned.

We did not analyze the effectiveness of interventions described. In all cases, 2 persons assessed the sources and extracted the data, resolving discrepancies by joint review and consensus.

### RESULTS

The 110 papers retrieved through the PubMed search described school health services in 52 countries. The Google search engine generated informa-

**Table 2**  
**Examples of Indicators to Express Normative Staffing Level for School Health Services Used in Countries**

Indicator	Country Examples
<b>Nurse-to-student ratio</b>	Varied from 1:350 in Armenia and 1:60-100 children in kindergarten in Romania <sup>36</sup> to 1:3000-5000 in Philippines <sup>19</sup>
<b>Nurse-to-student with special needs ratio</b>	Varied from 1:200 in China (Hong Kong) <sup>85</sup> to 1:400 in Hungary <sup>36</sup>
<b>Doctor-to-student ratio</b>	Varied from 1:800 for a part time doctor equivalent in Hungary <sup>36</sup> to 1:8235 in Singapore <sup>42</sup>
<b>Dentist-to-student ratio</b>	1:100-1500 in Romania, <sup>36</sup> 1 dental therapist:1400 in Singapore, <sup>42</sup> 1:9800 in Cyprus <sup>36</sup>
<b>Specialist-to-student ratio</b>	1.5 full time paediatrician and 0.5 full time neurologist for more than 100 students in Belarus <sup>40</sup>
<b>Number of nurses per one school</b>	1 nurse per school in Australia, <sup>50</sup> Oman, <sup>117</sup> Sweden, <sup>81</sup> United Kingdom, <sup>78</sup> Korea, <sup>20,43</sup> Belarus <sup>40</sup>
<b>Number of school teams per number of schools/students</b>	<ul style="list-style-type: none"> <li>• Six teams (nurse, nursery nurse, clerical assistant) per 30 schools in the United Kingdom<sup>118</sup></li> <li>• One team (psychologist and one nurse) per school in the Republic of Korea<sup>43</sup></li> <li>• One team (1 manager, 1 doctor, 2 psycho-pedagogic consultants, 2 social workers, 2 paramedical workers and 1 administrative collaborator) per 11000 weighted students in Belgium<sup>36</sup></li> <li>• One team (nurse, social worker, administrative assistant, part time doctor) per school with more than 1000 students in Togo<sup>17</sup></li> </ul>
<b>Number of weekly hours</b>	3.1 (doctors), 23.3 (registered nurses), 26.3 (enrolled nurses), 3.3 (visiting nurses) in New Zealand <sup>108</sup>

tion from another 44 countries, and the sources from the grey literature added 6 countries. All 145 sources described school health services in 102 countries and territories, or 52% of the number of countries that are members of the WHO. Table 1 shows the review included 47 high-income, 26 upper-middle income, and 29 lower-middle- and low-income countries (LMICs). Ninety-two sources described routine school health service provision (92 countries), and 60 sources described service provision in a context of a project or experiment (41 countries). The countries most represented (at least 7 sources) in the review were: United Kingdom, China, Australia, Canada, Sweden, and France. The majority of countries were represented by a single source (58 countries).

### Target Group

The age of the target group is broadly defined in the literature. In sources reviewed the age ranged from 1.5 year-olds to 26 year-olds. The target group was defined based on school grades<sup>36</sup> or their sub-

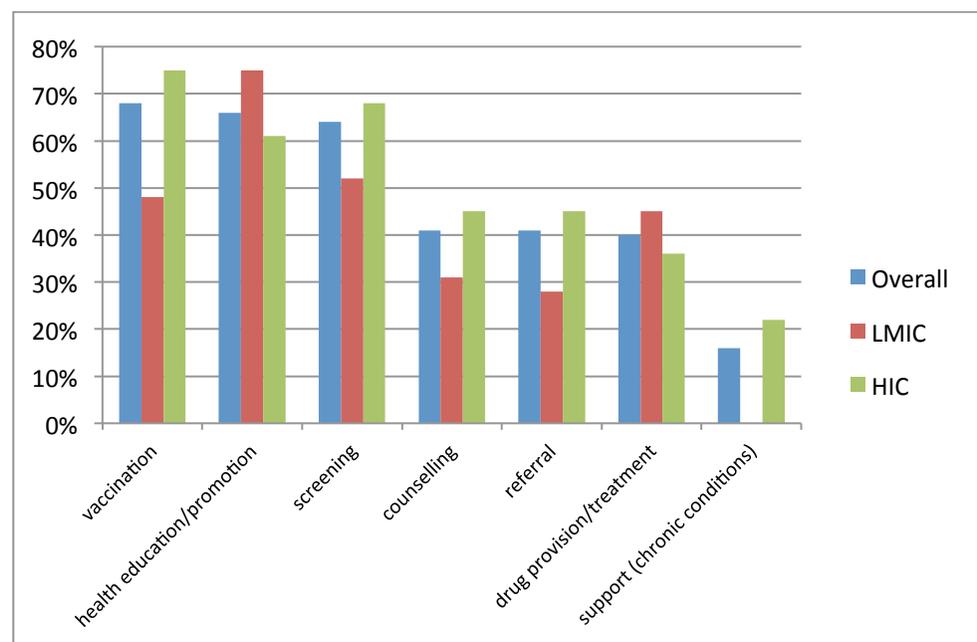
groups (primary, middle, and secondary school),<sup>16</sup> characteristics other than age and grade (eg, adolescents and children with chronic conditions), or a combination of age with a factor of vulnerability (eg, war-affected 10-13 year-old children, or 7-18 year-old children with special needs).<sup>47</sup> Target group was defined by sex in 12 papers.<sup>18,24,28,32,33,39,48-53</sup>

In most of the sources the target group was broadly defined as “all students,”<sup>54-58</sup> “all age groups,”<sup>36</sup> “all year groups,”<sup>11</sup> or provided a broad age range such as 4-16 year-olds.<sup>59</sup> Many sources indicated both middle and high school students as a target group,<sup>28,60</sup> and some indicated a narrow age range of the target population. The latter was usually the case when human papilloma virus (HPV) vaccination was concerned,<sup>49</sup> mental health screening for depression and counseling,<sup>61-63</sup> or specific situations (eg, mental health screening and referrals for 1st-grade students not ready for general education).<sup>64</sup>

### Providers

Overall, 32 sources did not specify the type of

**Figure 2**  
**Most Common Types of School Services by Income Level**



provider. The providers most commonly mentioned are nurses (59 countries), doctors (49 countries), psychologists (32 countries), dentists (12 countries), psychiatrists (12 countries), social workers (11 countries), and counselors (9 countries). Other providers included specialist physicians (pediatrician, cardiologist, dental health specialist, endocrinologist, gastroenterologist, gynecologist, hematologist, nephrologist, neurologist, ophthalmologist, orthopedist, otolaryngologist, tuberculosis specialist, pulmonologist), nursing and midwifery (nutrition nurse, psychiatric nurse, medical assistant, midwife), pharmacists, allied professions (audiologist, nutrition supervisor, nutritionist, occupational therapist, physiotherapist, physiotherapy nurse, speech therapist, specialist in early childhood education, substance abuse counselor), and other categories of health workers (health assistant, health educator, health supervisor, immunization provider, medical student, mental health professional, community health worker, youth worker).

The majority of the described countries (N = 59) have dedicated school health personnel. Most often

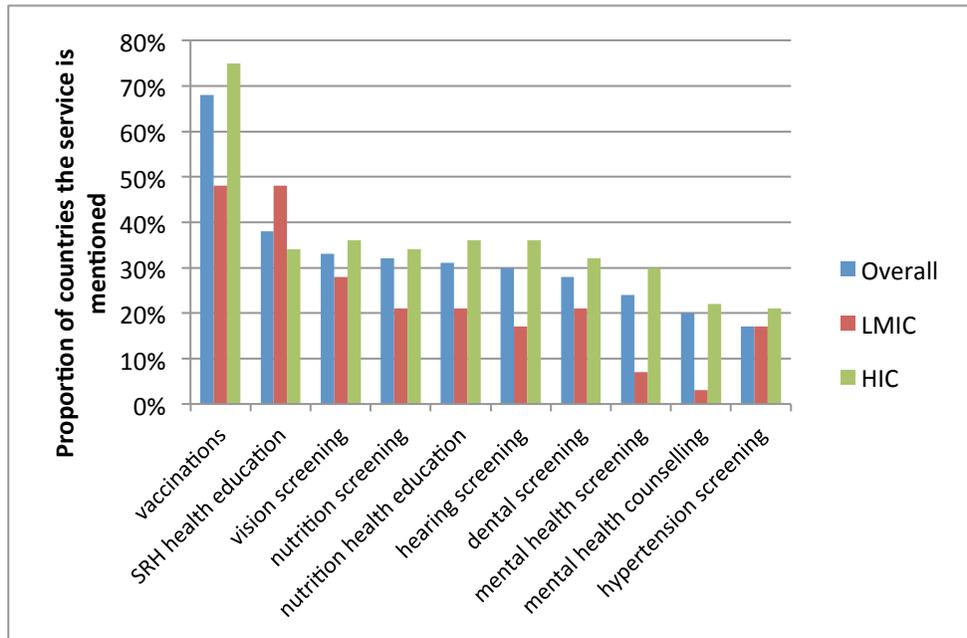
these include nurses (54 countries), school doctors (36 countries), psychologists (17 countries), dentists (6 countries), social workers (6 countries), and counselors (5 countries). Other dedicated providers included speech therapists, health workers, and orthopedists. The non-dedicated personnel most often included general practitioners/family doctors (17 countries), psychologists (17 countries), psychiatrists (11 countries), and nurses (11 countries). Dedicated school health personnel are usually, but not always, based on school premises (51 countries).

In 41 countries, the healthcare personnel provide services for other population groups, but periodically make visits to schools, or receive students in an organized manner in school health centers or in the primary healthcare facility. Approximately one-third of countries (N = 31) have both dedicated and non-dedicated health personnel involved in providing school health services.

### Normative Staffing Level

The reviewed sources differed substantially in the way the normative staffing level was presented,

**Figure 3**  
**Top 10 Intervention in School Health Services**



which prevented comparisons across countries. Table 2 presents an overview of various indicators found in the literature to describe the normative staffing level for school health services, with examples from countries.

**Service Areas**

Services were provided in 16 health areas including infectious diseases (72 countries), mental health (48 countries), nutrition (44 countries), sexual and reproductive health (44 countries), dental health (38 countries), vision (35 countries), hearing (31 countries), emergency care (25 countries), substance use (25 countries), chronic illnesses (17 countries), musculoskeletal disorders (16 countries), violence (10 countries), endocrinology (5 countries), neurology (5 countries), other services (59 countries). Twenty-four sources did not specify the area.

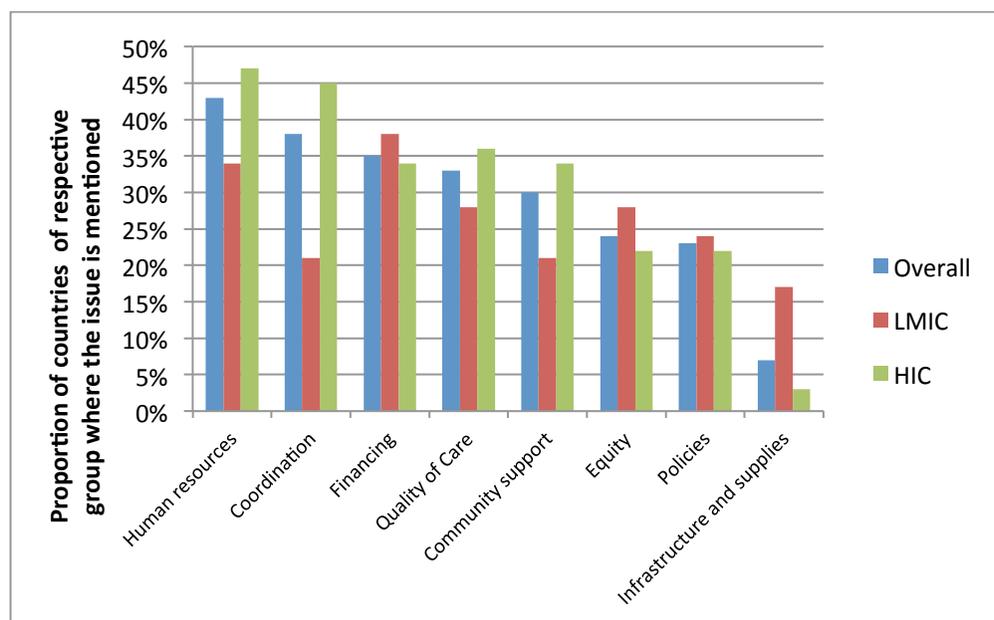
HPV, parasitic disease, tuberculosis, and flu were the most common foci for infectious diseases services. Mental health services focused on self-harm, depression, well-being, stress, and aggression. Nutrition services were often concerned with height/weight and body mass index (BMI) measurement,

nutrition supplements, obesity and anemia. Reproductive health services focused on HIV, sexually transmissible infections (STIs), adolescent pregnancy, and contraception.

Dental health services were not specified in the majority of sources (34 sources describing 34 countries); sources that did indicate the type of dental service mentioned promoting dental hygiene (5 countries), providing dental sealing (1 country) and dispensing fluoride-rich dental products (1 country).

Vision conditions were usually not specified, but on 2 occasions were mentioned with respect to color blindness<sup>28,36</sup> and myopia/amblyopia.<sup>36</sup> Musculoskeletal services were concerned with scoliosis in the majority of cases (10 countries) or not specified. Chronic conditions included asthma (3 countries), diabetes (2 countries), epilepsy (1 country), physical disability and motor disorders (4 countries) and were not specified in 14 papers. Violence included child abuse (7 countries), sexual abuse (2 countries), and harmful cultural practices (1 country). Substance use services were concerned with smoking in 4 countries and alcohol in one country, but in the majority of cases, the substance(s) were not

**Figure 4**  
**Organizational Challenges Prominent in School Health Services Literature**



specified. No further details were given for emergency care services and hearing.

A service could be any type from health education to screening, treatment and referral (Figure 2). By analyzing *both* the type of service *and* service area, we identified most common interventions (Figure 3). With the exception of mental health interventions that are often part of a project, other interventions were provided routinely.

### Setting of Service Provision

Services were provided most commonly on school premises (97 countries). In 24 countries, services were provided both on school premises and in healthcare facilities. Referral services, drug provision/treatment and support for children with chronic conditions were mentioned only in school-based service provision.

### Organizational Challenges

The majority of sources described organizational challenges (96 sources). Figure 4 shows the most commonly cited organizational issues.

Human resources issues included staff short-

ages,<sup>26,36,65</sup> high workloads,<sup>20,66</sup> lack of training and continuing professional education opportunities, and low motivation. The most frequently reported problem was the lack of training, either in general,<sup>67,68</sup> or specifically in adolescent health,<sup>69</sup> or mental health.<sup>70</sup>

The issue of inadequate coordination among multiple service providers or sectors (in particular health and education) was reported frequently. Specific aspects included the need for greater support from teachers and other school authorities,<sup>71,72</sup> the need for better structured integration between health and education within the school,<sup>73,74</sup> unclear division of roles and responsibilities for health education,<sup>75-77</sup> and the need to improve working relationships among school health providers and the workers in primary care.<sup>11,13</sup>

Finance related issues were mentioned most frequently in the context of lack of funding from the government.<sup>12,36,78,79</sup> Quality of care issues included low standards of services, challenges around delivery mode and premises,<sup>12,70,80,81</sup> and lack of standards for evaluation of school health services.<sup>36,37,44</sup>

Community support issues encompassed a range of problems such as persistent negative im-

age about vaccinations among some members of the community,<sup>52,53,65</sup> conservative attitudes and social stigmata concerning sexual and reproductive health services,<sup>14,82-84</sup> and insufficient involvement of families, teachers, and communities in health promotion programs.<sup>36</sup>

Inadequate policies were reported *vis-a-vis* the position of school health services within educational institutions and responsibilities of health personnel,<sup>45,68,85</sup> and when the modalities of school health service delivery are not clearly defined.<sup>22,86,87</sup> The lack of support for the introduction of new programs was mentioned, especially concerning sensitive areas of sexual and reproductive health, and mental health.<sup>84,88,89</sup>

## DISCUSSION

The global picture of school health services drawn from this review is incomplete; it does not include 48% of WHO Member States. Moreover, the results are dominated by the literature from high-income countries (HICs) that were represented at 56% versus 35% of LMICs. An additional limitation comes from the fact that our analysis, more often than not, is based on sources that describe the intended policy rather than the reality one may find in a particular country.

Our analysis found that structurally, school health services are well placed to contribute to adolescent health and development. They constitute a common way of organizing services for children in educational institutions. They exist in some form in at least 102 countries and territories, and in the majority of cases, as a form of routine service provision (94 countries). Whereas globally LMICs constitute 39% of countries, in our review 28% of countries were LMICs. It is unclear whether this is because of the publication bias or because school health services are less common in LMICs.

In a previous study we reported that the proximity of service provision to students (school-based provision), the type of staff assignment (dedicated staff), and involvement of a variety of healthcare professions in school health service provision are important characteristics linked to several dimensions of quality of care such as effectiveness, equity, responsiveness, and efficiency.<sup>90</sup> In the majority of countries included in the review, services are described as being provided on school premises

(97 countries), by dedicated health personnel (59 countries), with the involvement of a wide range of other professionals. This global picture is in line with what was found previously in the context of the European region, although global variations in the *nurse-to-student* ratio in our review are even wider (varying from 1:350 in Armenia to 1:3000-5000 in the Philippines).

School health services evolve over time attempting to align with the changing health and developmental priorities of adolescents. Many countries have been, and still are, in the process of school health services reform.<sup>36,90,91</sup> Cyprus, Denmark, Hungary, and Northern Ireland reported an ongoing reform in 2009, and another 17 countries reported that some kind of revision of school health services took place within 5 years prior to 2009.<sup>36</sup> Between 2008 and 2011, Albania, the Republic of Moldova, and Ukraine undertook situational analyses of national school health services, and developed roadmaps to improve their relevance to current priorities. Our review suggests, however, that important causes of mortality and ill health in adolescents such as mental health problems, violence, injuries, and chronic conditions are neglected in school health services. Despite mental health being the number one cause of ill health in adolescents, our review found that mental health services are less common in LMICs, and often are provided in a context of projects rather than routine service provision. Another potentially neglected area – relative to the burden of disease – is violence. Interpersonal violence is the leading cause of mortality in the Americas and ranks among the top 5 causes of death for older adolescent males in every region, including HICs.<sup>1</sup> Our review found services related to violence in only 8 HICs and 2 LMICs. Unintentional injuries are a leading cause of death and disability among adolescents<sup>2</sup> yet injuries were not mentioned in the sources we reviewed. Finally, support for pupils with chronic conditions was rarely mentioned, and only in HIC context. Yet, the rise of the number of perinatally-infected HIV adolescents, among other chronic conditions, poses new challenges to our understanding of the impact of this chronic condition on educational outcomes, and the influence of the educational setting on the course of disease.

A wide range of services is provided from vaccination to health education, screening, counseling, referral, and drug provision (Figure 2). There was not

sufficient information available to assess whether and how these various types of services are linked. This is a central question, however. Comprehensive care is widely recognized as key to the overall quality of care. Comprehensive means not only the extent to which care responds to the full range of health problems of an individual or of a given community, but also that for any given condition it encompasses in a coherent way of providing health promotion and prevention interventions, as well as diagnosis and treatment or referral.<sup>92</sup> Concerns have been raised that discrete interventions, uncoordinated both theoretically and practically, could be ineffective or cause harm.<sup>93</sup> A new rationale for comprehensive coordinated interventions is added by the growing body of research suggesting that health risk behaviors among adolescents tend to cluster and are mutually predictive.<sup>94,95</sup> Smoking, drinking, illicit drug use, sexual risk, and aggressive behaviors often co-occur due to shared risk factors and social determinants.<sup>94</sup> A systematic review of effective interventions for reducing multiple health risk behaviors in adolescence concluded that integrated prevention programs are feasible and effective and may be more efficient than discrete prevention strategies.<sup>94</sup>

The impact of school health services ultimately will depend on the effectiveness of interventions applied. Our review found that the top 5 interventions include vaccinations, sexual and reproductive health education, vision screening, nutrition screening, and nutrition-related health education. Whereas the effectiveness of vaccinations is well researched, the evidence base for other common interventions is weak,<sup>96,97</sup> or tested in other population groups.<sup>98-100</sup> Health education and health promotion is the second most common type of service but the literature gives little insight as to what is actually being done. Sexual and reproductive health education – the second most popular intervention in school health services – might be anything from an outdated leaflet being distributed to evidence-based, comprehensive sexuality and relationship education carried out by teachers in collaboration with the school nurse.

Interestingly, of 47 sources that mentioned counselling, only 5<sup>62,101-104</sup> mentioned cognitive behavioral therapy, problem-solving approaches, or motivational interviewing – approaches that have good evidence of effectiveness. When there is a regular check-up in place, the opportunity of a contact

between the healthcare provider and the student is not used to have a health dialogue;<sup>105</sup> in our review, when the service was provided in healthcare facilities, only 3 countries reported counseling as part of the service.

Contraceptive service provision is an effective intervention to reduce pregnancy before the age of 20<sup>106</sup> – a public health concern for many countries in the world.<sup>107</sup> Yet, in our review, we found only 4 countries that have policies to dispense contraceptives in schools: Burkina Faso, New Zealand, the United Kingdom and the United States.<sup>16,74,108-111</sup> At the same time, interventions that violate human rights, such as mandatory pregnancy testing, were reported.<sup>32,33</sup>

There are more commonalities than divergences among countries in the way main organizational challenges that school health services face are described in the literature. In both LMICs and HICs the issues of shortage of human resources, poor coordination, inadequate financing, low community involvement, equity, and inadequate policies to support the services are described as common, and have been reported previously.<sup>36</sup> However, the scale of these problems is likely to be different in HICs and LMICs. Globally, 100 countries currently fall below the threshold of 34.5 skilled health professionals (midwives, nurses, and physicians) per 10,000 population,<sup>112</sup> all of them being LMICs. The wide variation in availability and accessibility of human resources for health between and within countries is likely to be even more dramatic in school health services. This shortage is unlikely to be solved anytime soon, and it may pose different challenges in low-income countries. Whereas focus, effectiveness, and accountability constitute a sensible agenda irrespective of the level of socio-economic development, LMICs will have additional challenges due to deeper health systems constraints. A trivial response to this challenge seems to be that school health services in LMICs, perhaps, should focus on 2-3 key priorities instead of trying to deal with the whole range of health and development issues. However, as mentioned earlier, interventions for reducing multiple health risk behaviors in adolescence may be more effective and efficient than single disease prevention strategies. Limited funding for prevention and time constraints in schools also make coordinated intervention for multiple risks attractive.<sup>93</sup> It is possible,

therefore, that making coordinated prevention for multiple risks the philosophy of school health services is a better strategy than over-focusing on a few health priorities. More research will be needed to assess this hypothesis.

Poor/unknown/uneven quality of care is a common concern.<sup>26,67,108,109</sup> Standardization might help to monitor quality, and focus improvement efforts. A recent example comes from the European region, where, through a consultative and inclusive process, emerged the *European Framework for Quality Standards in School Health Services and Competencies for School Health Professionals*.<sup>113</sup> The framework, which is addressed primarily to national and regional level policymakers, can be adapted by individual countries to enable them to develop services in line with students' needs.

## IMPLICATIONS FOR HEALTH BEHAVIOR OR POLICY

Based on this review, the following areas for advocacy, research, policy and practice are recommended:

***Better alignment between priority health and development issues in adolescence and the content of school health services.*** In some countries the content of school health services seems to be informed by an archaic understanding that focuses on individual level factors that might influence educational outcomes such as sensorial and musculoskeletal deficiencies. Today we know that mental health, adolescent pregnancy, bullying and other forms of interpersonal violence, as well as chronic conditions may have disastrous consequences not only for students' ability to learn, but for their future health and well-being. Mental health, injuries prevention, support for students with chronic conditions, and violence prevention, detection, and referral are the areas that might need greater consideration in the package of services provided by school health services.

***Strengthen the evidence base for most common interventions and service delivery models.*** The current absence of evidence of effectiveness of some popular school-based screening programs cannot be taken to mean that they are not beneficial. However, the absence of normative guidance on age-appropriate screening tests, effectiveness data from robust trials, and cost-benefit analysis of

school-based screening programs makes the decisions regarding how best to allocate school health personnel time arbitrary. The cost-effectiveness of various models of school health services organization needs to be understood, as well as an adequate *provider-to-student* ratio.

***Strengthen the evidence base of the best value for money of school health services in various epidemiological and health systems contexts.*** What school health services can and should do will differ in Benin that has 0.84 nurses per 1000 population and in Norway that has 14.84 nurses per 1000 population.<sup>114</sup> In addition, regions and countries face contrasting epidemiological situations, as shown by 2012 mortality and morbidity estimates.<sup>1</sup> We need better understanding on how to organize school health services in various health systems and epidemiological scenarios to maximize returns on investments.

***Accelerate knowledge translation from research to school health practice.*** Such a translation step is necessary so that interventions successfully applied in other fields, settings, and population groups become part of school health services portfolio. Some examples are brief interventions, motivational interviewing, contraceptives provision, psychosocial risk screening and counseling intervention, and interventions to reduce multiple health risk behaviors.<sup>94,115</sup>

***Improve the collection, analysis and use of data in school health services.*** Overall, a greater rigor of conceptualization of school health services, implementation, and measurement is required. There is scarcity of data globally, regionally, and nationally about health/education systems inputs (eg, workforce education), process of care (eg, coverage with key interventions, quality of care), improvements in health outcomes attributable to school health services, and equity. Many countries do not have data to monitor how their intended policies are actually implemented. Operation research is much needed in this area. Countries would benefit from in-depth situational analysis of their school health services that would inform development of roadmaps for organizational changes towards better alignment of the scope of school health services with both the evidence base and national health priorities. In addition, a global repository of information on school health service policy and practice might stimulate

cross-country experience sharing, policy dialogue, and quality improvement.

**Develop and implement service standards.** A standards-driven approach has been used to allow health services to realize aspirational but achievable goals through assisting in the implementation of appropriate practices and guiding continuous quality improvement.<sup>1,113,116</sup> Standards for school health services will support managers and providers to reduce variability and ensure a minimal required level of quality in school health services; moreover, it will enable them to advocate for necessary resources. In addition, standards will enhance accountability. Regional<sup>113</sup> and global standards might accelerate this process; instead of recommending a specific way of organizing school health services, mandating a single process for dividing work among health professionals or creating a definitive set of quantitative values for system inputs, regional/global standards should allow individual countries to tailor them to their own specific needs.

**More active engagement in global, regional, and national advocacy.** Such an action will support the recognition of school health services as important contributors to adolescent health and development and a good investment of public funds. It is not an easy task - effective advocacy will depend on the implementation of the above recommendations, and *vice versa*, their implementation is only possible with more investment that comes with effective advocacy. Advocacy will be necessary over a significant span of time to generate the level of interest from the research community, governments, donors, international development organizations, professional and other societal organizations that will translate into investment.

### Human Subjects Approval Statement

No human subjects were involved; thus the information presented here was exempt from a human subjects review process.

### Conflict of Interest Declaration

All authors of this article declare they have no conflicts of interest.

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