

Abstract

Children's work that is harmful, hazardous, or is in other ways exploitative can create, exacerbate, or perpetuate an intergenerational cycle of poverty, malnutrition, and social disadvantage. The neglect or violation of a range of human rights exacerbates the conditions that lead to child labor, and child labor in and of itself raises issues of neglect and violation of human rights. Harm to individuals also deteriorates public health in their communities. The development of national and global responses to child labor should occur in the framework of a public health model set within the context of human rights, with particular attention to the rights of girls. This article briefly sketches an approach to a rights-based public health model for reducing and if possible eliminating harmful, hazardous, and exploitative children's work.

Le travail des enfants qui est nocif, dangereux ou, exploiteur sous d'autres formes, peut créer, exacerber ou perpétuer un cycle de pauvreté, de malnutrition et de désavantage social à travers les générations. Le manque d'intérêt pour les droits de l'homme ou leur violation exacerbent les conditions qui mènent au travail des enfants, lequel entraîne à son tour des problèmes de non-respect ou de violation des droits de l'homme. Le tort causé à la personne affecte la santé publique au sein des communautés. Le développement de ripostes nationales et mondiales au travail des enfants devrait s'effectuer dans le cadre d'un modèle de santé publique organisé dans le contexte des droits de l'homme, avec une attention particulière pour les droits des jeunes filles. Cet article esquisse brièvement une approche d'un modèle de santé publique fondée sur le droit visant à réduire et si possible éliminer le travail nocif, dangereux et exploiteur des enfants.

El trabajo infantil que es dañino, peligroso, o explotador puede crear, exacerbar, o perpetuar un ciclo intergeneracional de pobreza, desnutrición y desventajas sociales. El descuido o la violación de una variedad de derechos humanos exagera las condiciones que conducen al trabajo infantil, el cual en sí mismo y por sí mismo plantea cuestiones de descuido y violación de los derechos humanos. Los daños que sufren las personas afectadas también deterioran la salud pública en sus comunidades. El desarrollo a escala nacional y mundial de acciones enfocadas en el problema de trabajo infantil debe ocurrir en el marco de un modelo de salud pública con atención a los derechos humanos, y con particular atención a los derechos de las niñas. Este artículo esboza un modelo de salud pública basado en los derechos humanos para reducir y, si es posible, eliminar el trabajo infantil dañino, peligroso, y explotador.

ECONOMIC EXPLOITATION AND THE HEALTH OF CHILDREN: Towards A Rights-Oriented Public Health Approach

David L. Parker and Sarah Bachman

Social policy questions concerning child labor, health and safety are neither unique to the developing world or to the current era. The earliest regulation of child labor dates to 1284, when a statute adopted by a guild of Venetian glass makers forbade the employment of children in certain dangerous activities within the glass trade.¹ And yet, child labor long has been considered primarily an issue of labor economics, not of children's health or children's rights.²

Although the 1990s saw an upsurge in the study of child labor, little has been published concerning the health effects of child labor and recognition of the impact of child labor on the rights of the child, either in terms of the health impact on individual children or in broader public health terms.³ A rights-based public health orientation could add four dimensions to an understanding of the issue. First, it ensures that exploitative and abusive work is not only considered a labor market or health problem, but also an issue of human rights. Second, it focuses attention on the legislative and policy framework that exists to promote and ensure the rights of children to protection, and to the exercise of their individual rights. Third, it draws attention to the relationship among individuals, their community, and the state. Fourth,

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it helps to identify potential burdens on the lives of individuals that are created by the presence (or absence) of government programs and policies that address child health and child labor.⁴ Thus, a better understanding of the relationship among human rights, work, child health, and community health will help construct appropriate public health interventions for the least understood, but potentially most important, effects of child labor.

It is the hypothesis of this paper that children's work that is harmful, hazardous, and carried out in subhuman working conditions can create, exacerbate or perpetuate an intergenerational cycle of poverty, malnutrition, and social disadvantage. Early and inappropriate child work, complicated by illiteracy, can lead not only to the neglect and violation of human rights in the short term but also to a broader deterioration of public health.

Although detrimental child labor remains a problem in the United States and other industrialized nations, the problems of industrialized nations have been covered in depth elsewhere and are not a focus of the current article.⁵ Even so, all developing and industrialized nations have both human rights and public health reasons to be concerned with detrimental child labor both inside and outside their borders, as will be discussed.

Defining Child Labor

Defining child labor in a human rights context is more difficult than it might appear to be. The Geneva Declaration on the Rights of the Child, passed by the League of Nations in 1924, was the first comprehensive international document to specifically affirm the rights of children. The 1959 Declaration on the Rights of the Child recognized the right of children to an education and freedom from exploitation. While several legally binding international human rights documents have included specific provisions on the rights of children, the 1989 United Nations Convention on the Rights of the Child (CRC) was the first legally binding international instrument to incorporate the full range of civil and political rights as well as economic, social, and cultural rights in relation to children.⁶

The CRC declares in Article 32 that a child has a right to protection from “economic exploitation.” At face value, this provision suggests that all child work for pay may be against a child’s human rights. And yet “exploitation” is a subjective term, open to interpretation. The vast majority of child laborers work for their families, and many perform tasks that might be considered training for future income-earning jobs or life roles.⁷ Where an observer with more economic resources might see exploitation, a person with fewer resources might see an apprenticeship or a foot in the door to future work.⁸ Differences of perception are also possible in relation to other rights defined by the CRC. Article 12, for instance, declares a child’s right to express an opinion in matters that affect him or her, and to have that opinion given weight appropriate to the child’s age and maturity. This has become known as the “child participation” right, and is the subject of many arguments, particularly when children themselves have exercised this right in arguing against child labor standards set by adults.⁹

International labor standards also are disputed.¹⁰ The International Labor Organization’s Minimum Age Convention of 1973 (ICO Convention 138) defines most work performed by children under the age of 15 as “child labor.” Variations are allowed according to the hazard involved in the work. Lower working ages are allowed in developing countries. Article 7 of ILO Convention 138 allows Member states to “substitute the ages of 12 and 14 for the ages of 13 and 15” (i.e., to permit children who are 12 years of age to work).¹¹ Many developing nations have complained, however, that age-based child labor laws are not appropriate for their needs. In countries such as India and Bangladesh, many children do not have birth certificates, further complicating enforcement.¹²

In the 1990s, the ILO and other international bodies decided to focus attention on the most egregious forms of child labor. In 1999, the ILO adopted the convention on the “Worst” Forms of Child Labor (Convention 182). The convention calls for “the prohibition and immediate action for the elimination” of the worst forms of child labor such as prostitution, forced labor, and “work which, by its nature or

the circumstances in which it is carried out, is likely to harm the health, safety or morals of children." States parties are encouraged to adopt laws that proscribe this kind of work. ILO Recommendation 190, which was adopted immediately after the convention, contains a list of work activities that the ILO general assembly considered appropriate for this category.¹³

The array of formal and implied meanings of "child labor" can lead to policy prescriptions that are not always in concert, and are at times contradictory.¹⁴ To avoid confusion, this paper will use the term "exploitative" or "abusive child labor." We refer to UNICEF's definition: "full-time work at too early an age; too many hours spent working; work that exerts undue physical, social or psychological stress; work and life on the streets in bad conditions; inadequate pay; too much responsibility; work that hampers access to education; work that undermines children's dignity and self-esteem, such as slavery or bonded labor and sexual exploitation; work that is detrimental to full social and psychological development."¹⁵ Note that this definition recognizes that not all work is bad for children, and that some may be good. Further, it recognizes that seemingly similar work may be good or bad for children depending on the conditions in which it occurs.

Prevalence of Child Labor

The ILO estimates that 250 million children between the ages of 5 and 14 work part-time or full-time.¹⁶ The ILO admits that estimates of working children often undercount the number of children, mostly girls, whose economic activities (e.g. unpaid housework) are excluded from surveys. Thus, the ILO surmises that the true number of working children may be considerably higher than 250 million.¹⁷

Educational data also support the higher estimate of the number of working children. As shown in Table 1, many nations have set a minimum age for employment. And yet, statistics on child labor and related statistics on school enrollment and attendance—a rough but not exact proxy of child work—indicate that large numbers of children leave school early in almost all of these nations.

There are an estimated 1.5 billion children between 5 and 18 years of age in developing nations. In many nations, fewer than 50% of children complete a primary school education (see Table 1). The level of secondary school enrollment is considerably lower than that for primary school.¹⁸ The lack of education disproportionately affects girls. In some nations, fewer than 25% of boys and 15% of girls are reported to be enrolled in secondary school.¹⁹ If 50% of children under age 18 in developing nations do not attend school, and if most of these children are engaged in some form of work, the number of working children can conservatively be estimated to be closer to 500 million. This figure is strikingly close to the estimate of out-of-school children given by Ferguson: approximately 410 million children.²⁰

More than two-thirds (70.4%) of the total number of working children are assumed to be in the agricultural sector. Children in manufacturing; wholesale and retail trade;

Country	Age for Compulsory Education	Minimum Age for Employment	Percent of Children Reaching Grade 5 1990-1995
India	14	14	59
Nepal	11	14	52
Mexico	14	14	84
Nicaragua	12	14	54
Morocco	14	12	75
Egypt	15	12	98
Pakistan	—	14 to 15 by industry sector	14
Bangladesh	10	12 to 15 by industry sector	47
Least Developed Nations	—	—	58
Developing Nations	—	—	74

Table 1. *Age of Compulsory Education Compared With Minimum Age for Employment and Completion of Fifth Grade for Select Nations.*¹²⁵

restaurants and hotels; and community, social, and personal services are thought to comprise 23%. The remainder work in miscellaneous trades. However, data on the exact number of children in each occupation is imprecise, particularly with regard to clandestine or illegal activities such as child soldiering and prostitution. The ILO is trying to improve methods of data collection.²¹ In the meantime, the lack of accurate and sufficiently disaggregated data can complicate policymaking and efforts to minimize the harmful impacts of child labor. The compilation of better data, including not only the numbers of working children but also the impact of work on their welfare, should be a central part of a rights-oriented public health response to child labor.

Child Labor in a Public Health Context

Any public health examination of child labor must take into account at least two levels of risk. One is to the child. The other is to the child as a member of a society. A rights-based approach to public health recognizes that poverty and social exclusion have a major impact on the health of individuals and populations.²² Inadequate public health, nutrition, and education may not only be violations of human rights, but remain major impediments to continued improvements in child survival.²³ Robertson et al. note that policies that are oriented towards whole "populations can utilize scarce resources to maximum benefit."²⁴ In developing this approach, it is recognized that whether interventions benefit the individual and/or the health of the public is at times vague.²⁵

Exploitative and abusive child labor contributes to a cycle of poverty and poor health and it is likely that the overall impact might be greater on the population as a whole than on any one child. The neglect or violation of a range of human rights exacerbates the conditions that lead to child labor, and child labor in and of itself raises issues of neglect and violation of human rights. This is true for individuals and must be understood within the context of their communities and is most readily viewed through the framework of the four types of rights defined within the CRC (i.e., protection, survival, membership, empowerment).^{26, 27}

For example, a child's survival is inextricably linked to the health and well-being of its mother especially in the early part of life.²⁸ In this respect it is also clear that the welfare of women is linked to issues related to child labor. Girls are frequently excluded from education, and many work in relatively isolated environments. Not only do these conditions result in lost opportunities for individual girls, but also maternal illiteracy and social isolation correlate closely with more child-bearing and greater mortality and morbidity among children born to these women.²⁹ This cycle may be perpetuated when the families of these women subsequently are at increased risk of poverty. For these families, child labor may be understood to be necessary for survival. The approach outlined here offers a developmental and life-course means of understanding child labor and its consequences.³⁰

Rights issues are also raised in the context of the work environments themselves. Forastieri classifies children's job-related hazards as: occupational accidents, occupational diseases, ergonomic hazards, harmful substances and sources of exposure, exposure to physical agents, and psychosocial hazards.³¹ Although this paper discusses these classifications later, a review of textbooks on occupational health and safety suggests that there is no accepted taxonomy of work-related hazards.^{32, 33}

Thus, although Forastieri offers a useful starting point for analysis and discussion, this overall classification is insufficient. Forastieri's classification analyzes harm and hazard to the individual child but does not provide a clear way to analyze the impact of work on the larger community of individuals. From a rights-oriented public health perspective, the importance of children's work can be classified into two broad categories: (1) the relationship between work and growth/development, which predisposes children to exploitative and abusive work, as discussed above; and (2) job-specific hazards as they relate to injury and illness. Hazards may, in turn, be divided into many types (e.g., biological, chemical, physical, mental) and these may be further subdivided into hazards leading to acute-onset harm (e.g., injury, pesticide poisoning) and chronic-onset harm

(e.g., degenerative diseases, silicosis).

The distinctions between the causes and the consequences of detrimental child labor are also blurred. For example, silicosis, a noncommunicable disease contracted by exposure to silica dust (a product of brick-making, stone-cutting, etc.), predisposes workers to tuberculosis, a communicable disease of great public health significance.³⁴ While tuberculosis may be treated, if not properly treated it can reduce the health of the community at large and can perpetuate the cycle of poverty for the family, which in turn contributes to child labor.

Growth and Development and the Public Health

In this section, we will consider how growth and development of the child is related to public health outcomes, focusing on reproductive health, general health conditions of working children, intellectual development, and community health outcomes. Then we will consider job-specific hazards, in terms of acute-onset harm and latent-onset harm.

Reproductive health

The health of the child is inextricably linked to the health, and health practices, of their mothers. According to the World Bank, "At least 20 percent of the burden of disease among children less than 5 years old is attributable to conditions directly associated with poor maternal health, nutrition and the quality of obstetric and newborn care."³⁵

Up to 80% of maternal deaths in developing countries result from obstetric complications. Each year, almost 600,000 women die from pregnancy-related causes, leaving behind almost two million motherless children.^{36, 37} The lack of reproductive and other maternal health services, including adequate pre- and postnatal nutrition, has a profound impact on child survival. Without these services, women are likely to have more children who are at increased risk of early death or morbidity and, if they survive, may be less likely to attend school.³⁸ Children whose mothers die may be left without families, or living in reconstructed families (e.g., step-parent, adoptive). Children in reconstituted

families may be rejected by new parents, may have to work at home, or may have to leave home in order to work.³⁹

An overwhelming example of the social costs of parental death can be found in sub-Saharan Africa today. Parental death has led to the massive displacement of children to the streets.⁴⁰ *Time* magazine notes that by the end of last year “10.4 million of the children under 15 will have lost their mothers or both parents.” As orphanages fill and children find themselves unwelcome in the homes of relatives, thousands find they have no choice but to live on the street and work.⁴¹ Most fail to attend school.⁴²

General health conditions of working children

Children who survive the first few years of life may face obstacles caused both by general conditions (poverty, leading to malnutrition) and the specific hazards of their occupations. The problem of poor health among working children is reflected in most studies that have tried to evaluate it. Several studies have surveyed the general health of child workers.⁴³ Studies on the general health of child laborers have tended to be small and/or have poorly defined control groups. Many have also failed to clearly define the study group and how specific diseases were diagnosed.^{44, 45, 46} These study design problems are substantial, particularly when considered in relation to the general health conditions of the populations being studied. For example, in many parts of the world where child labor is rampant, sanitation is poor, waste control creates favorable conditions for waterborne diseases, the accumulation of garbage attracts vermin, and medical care is sporadic or not available even for children who are not engaged in child labor.⁴⁷

Intellectual development

Perhaps the most insidious impact of harmful and hazardous child work is on intellectual development and the repercussions of illiteracy on community health. A strong correlation exists between harmful and hazardous child work (especially that which results in a child not attending school) and adult illiteracy.⁴⁸ If work blocks the child from regular school attendance, the child may then grow into an

illiterate adult.⁴⁹ Even when girls are enrolled in school, the burden of domestic chores stands in the way of educational progress.⁵⁰ Work often combines with a lack of affordable, quality, and relevant education as an impediment to children attending school.⁵¹ While this pattern is common, it is not absolutely predictive. While many unschooled parents send their children to school, and some interventions have succeeded in convincing large numbers of illiterate parents to send their children to school, it is equally clear that illiteracy fosters child labor.^{52, 53}

It is not surprising that exploitative and abusive child labor would have a dramatic impact on literacy; children spend long hours at work and often have little or no time away from the workplace. The ILO estimates that about half of the children classified as child laborers work full-time: "more than half of working children are toiling for 9 hours or more per day." Studies in several countries show that children work days of up to 10 and 12 hours. For instance, in a study of 360 children in Lahore, Pakistan, all worked at least 8 hours per day.^{54, 55}

In a study of 210 Malaysian children, the children worked an average of 10 hours per day. Thirty-eight children reported that they worked seven days per week and 132 only had 1/2 day off per week.⁵⁶ The WHO reported long hours of work for children in Sudan and Turkey, and Asogwa reported similar data for children in Nigeria, although the long hours in these cases were sometimes combined with school. Similar situations are found throughout the Indian subcontinent.^{57, 58, 59, 60} Although too many hours at work is a subjective measure, some analyses have begun to ask how many is too many when measured by educational attainment.⁶¹ Studies from the United States suggest that about 10 to 20 hours of nonhazardous and nonharmful employment per week can sometimes improve children's school attainment. More hours of work per week correlate with lower school attainment.⁶²

Community health outcomes

Early, hazardous, and harmful work for children can be related to health outcomes in the larger community.⁶³ An

estimated more than 7 million children are killed, injured, and disabled due to child labor each year. However, this figure appears to be based on very low estimates of the total number of working children.⁶⁴ Mercury poisoning, for instance, is common in gold mining with short- and long-term consequences on the environment and health.^{65, 66} The effect of mercury poisoning on children and adults is well known. Exposure can cause many severe symptoms, including birth defects, injury to the central nervous system, and renal damage.^{67, 68}

Girls' work is especially likely to reduce general public health outcomes. Today's illiterate mothers were yesterday's working girls, whose occupations, family obligations, or cultures barred them from receiving an education. Epidemiological studies have found a correlation between severe child malnutrition in a community, and lack of maternal education in that community. Thus, girls who work instead of attending school are more likely to have families of relatively less healthy children.

Children of mothers with no education have a substantial increase in risk of severe malnutrition when compared with children of mothers with a university education, and may be higher than the risk of illness imparted by bottle feeding instead of breast feeding. Maternal illiteracy has also been shown to be associated with low birth weight.⁶⁹ The education of girls and women, furthermore, is often cited as one of the most important ways of improving family health, and reducing the adverse conditions that lead to early child work.⁷⁰ Another barrier to girls' education is early pregnancy and young marriage that result in the termination of a woman's education. The age of first marriage for women is rising globally. Still, 50% of African women, 40% of Asian women, and 30% of Latin American women marry before the age of 18.⁷¹

According to Ferguson, "...there is indisputable evidence that, independent of other factors such as socioeconomic status and accessibility to health care, compared with those who have no education, a woman who has been to school for a few years" is more likely to marry later, seek prenatal care, have a smaller family, and have healthier children.⁷²

Adverse patterns may deteriorate public health over time, as male and female children mature. Nutrition-related problems may become long term through their impact on behavior, brain growth and development.^{73, 74} Gordon notes that "a relationship between birth weight and cognitive function in early adult life has been demonstrated, and the babies' condition at birth may be a risk factor for various disabilities."⁷⁵ Thus, illiteracy may play a role in placing each new generation of children at risk of becoming child laborers.

Job-Specific Hazards

A rights-based public health approach to child labor requires studies on the impact of specific occupational exposures on the health of young workers, but these do not appear to exist. They are not cited in the available literature or listed by standard electronic search services. It is not surprising, however, that there are no epidemiological studies on the impact of specific work-related exposures on the health of children. First, children are often working illegally. Second, children are rarely the beneficiaries of any labor contract, which would include health protection measures. Third, such studies are expensive and difficult to conduct, and therefore likely have not been conducted in countries where child work is common. Finally, children are often working in remote areas, making such studies logistically difficult.

While data on children is often deficient, data on adult workers is abundant. In the absence of short- or long-term exposure data on children, disease models may be developed that examine the impact of job-related exposures on the early development of disease. Logic argues that a child who begins work at an early age has many more years to develop a health problem as compared to adults exposed to the same hazard, and so latency effects on adults will be relevant to children. Table 2 depicts multiple hazards that may be faced by children in different occupations.

Many documented risks may be greater for children. Even when exposed to hazards that have been well defined and related to disease (e.g., silica and silicosis), most chil-

dren are offered little or no protective equipment.⁷⁶ When available, this equipment has been designed for use by adults and may be virtually useless for a child.

Acute-onset harm

A brief examination of the epidemiological literature in the United States illustrates some of the acute harm suffered by working children and adolescents. In relatively protected environments, injury represents a serious problem for working youth. In the agricultural sector of the United States economy there are frequent reports of children and youth being seriously injured or killed at work.^{77, 78}

Even in the absence of epidemiological studies focusing specifically on acute injury or toxic exposure to child workers, it is easy to understand how work could be hazardous. For example, scavenging garbage for materials to sell can have obvious and serious adverse health consequences. Garbage scavengers work around heavy machinery, including trucks and bulldozers, often climbing on top of the garbage in newly arriving trucks while the vehicles are still moving. Trucks may empty their contents indiscriminately on or near children (and adults). It is common to hear reports of small children being buried alive or even sinking into soft spots on the dump surface.⁷⁹ In many if not most dumps, spontaneous combustion can cause constant small fires, and occasionally, trash fires and dump landslides occur.

Morbidity is also high. Children and adults frequently eat food that they find, leading to digestive illnesses. A health survey of 740 scavenger children in Cambodia found not only common tropical diseases such as malaria and infections but also a range of debilitating conditions, from fevers to body pains, of undefined origins.⁸⁰ Puncture wounds are common and may result in tetanus.^{81, 82}

Latent-onset harm

Non-occupational studies of the impact of many substances on the health of children do exist. Perhaps the best studied of these substances is lead. Children are more likely to absorb lead than are adults. Children are also at signif-

icant risk of developing irreversible neurological damage.⁸³ Studies have also been conducted on the impact of mercury and carbon monoxide on development. Data indicates a significant impact of both substances on early growth and development. These substances are also well-documented reproductive hazards.⁸⁴ For hazardous substances that have

Industry	Task(s)	Selected Hazards	Health Impacts
Agriculture	Pesticide application; lifting, tending animals; lifting, operat-	Toxic chemicals, physical strain, moving machine parts,	Agriculture presents a broad range of task-dependent risks (e.g., pesticide poisoning, machine-related
Mining	Crushing and carrying stone	Dust, heavy lifting, falls,	Pneumoconioses including silico-tuberculo-
Brick Factories	Shaping bricks, carrying	Repetitive trauma	Pneumoconioses including silico-tuberculosis, injuries
Carpet Factories	Hand-knotting carpets, cutting	Organic dusts, sharp objects, repetitive trauma	Asthma, arthritis, lacerations,
Machine Shops	Polishing metal,	Unguarded machines, sharp objects, metal dusts, noise	Noise-induced hearing loss, amputations and lacerations, pneu-
Garbage Picking	Picking and sorting garbage	Chemical and biologic wastes, infectious organisms, rats	Infectious diseases, injuries, bites and stings
House Work	Cleaning, cooking, child care	Sexual violence, isolation,	Sexually transmitted diseases, failure to thrive, poor nutrition
Child Soldiers	Most forms of light military	Military violence, forced violence against family	Psychological trauma, loss of life,

Table 2. *Health Impacts of Child Labor for Selected Industries that Frequently Employ Children.*^{126, 127}

not been studied in relation to their impact on children, we can surmise that they will affect children more than adults. For instance, it is well known that in pharmacology, therapeutic doses are adjusted for the size and age of the child in order to avoid toxic effects.⁸⁵ The impact of exposures may be compounded for children who have a larger surface area in relationship to their weight than adults, rapid growth, and development as a whole.⁸⁶

Although conducted on adult populations, studies of silicosis provide a disconcerting example of the effect of latency on the appearance of disease.⁸⁷ The problem of silicosis is worldwide and is closely linked to the development of tuberculosis.⁸⁸ In India, two industries that have been reported to have a high prevalence of child laborers, stonecutting and slate pencil making, also have a high prevalence of silicosis—35% of stonecutters and 55% of workers in slate pencil making are affected with silicosis.⁸⁹ Studies of workers in Indian potteries showed the prevalence of silicosis to be approximately 15%. The prevalence of tuberculosis was similar. In some pottery-related occupations, the prevalence of silicosis was as high as 32%.⁹⁰ Furthermore, the overall prevalence of tuberculosis in the pottery industry was reported to be substantially greater than is reported for the overall population in India. The mean duration of exposure prior to the diagnosis of silicosis for individuals in this industry may be only 20 years.⁹¹

Children are also commonly found in brick factories, granite quarries, and granite crushing facilities, all of which are permeated with silica dust. The latter have been described as placing workers at significant risk of developing silicosis. In granite crushing facilities the prevalence of silicosis may be as high as 75%. Of the 18 cases described by Grundorfer and Raber, seven adult workers (39%) had silico-tuberculosis.⁹² Due to the extraordinary levels of dust exposure, these workers may have a mean latency of less than a decade prior to the onset of silicosis.⁹³ The heavy nature of the work in these facilities makes chronic injury likely. A single brick may weigh four kilograms and a child may carry over 1000 bricks in a single day.⁹⁴

The dose effect relationship between level of exposure and the development of silicosis appears to be linear,

with the appearance of silicosis ranging from a few months to a lifetime. The symptoms of silicosis are most likely to occur if the onset of exposure is at a relatively early age and exposure continues. Even after exposure to silica stops, the disease may progress. Individuals who begin work at an early age are likely to suffer from silicosis at a correspondingly early age. The incidence of tuberculosis increases with more severe silicosis.^{95, 96} Younger workers appear to be at significant risk of developing silico-tuberculosis as a result of their work but also as a result of poor nutrition, health care, and occupational conditions, including the need to work in relatively cramped and poorly ventilated environments.

Developing a Response: Global Policy, Health, and the Rights of Children

As demonstrated in the section above, the relationship of rights to child labor and child health is complex, and health disparities are reflected in a gap in the rates of child mortality, maternal mortality, female literacy, nutritional status, and access to primary school education.⁹⁷

The development of a global or national response to child labor should occur in the framework of a public health model set within the context of the rights of the child, and with sufficient attention to women's human rights.^{98, 99, 100} Efforts to eliminate child labor should be integrated with efforts that address social indicators (e.g., female literacy, infant mortality) related to gender inequalities and socio-economic status. These social indicators point to places for interventions not traditionally considered in academic and policy discussions concerning child workers.¹⁰¹ Interventions addressing these factors of child labor could help in shifting discussions of child labor from economic growth towards human rights and human development.¹⁰²

UNICEF has developed child growth and development plans that incorporate measures to reduce or eliminate child work—while fostering children's rights. Inherent in many of these plans is the ability to address child labor through their short- and long-term impact on individuals and communities. Starting in the early 1980s, UNICEF began to promote

the basic health of children with GOBI-FFF (growth monitoring, oral rehydration, breast-feeding and immunization - food, female education, and family planning). A basic tenet of UNICEF child survival programs (e.g., immunization) is that it be integrated with human development (e.g., education for all).^{103, 104} Although the original GOBI-FFF saved the lives of many children, it failed to address the underlying social and environmental problems that are at the root of many health problems.^{105, 106}

Pursuant to the Alma Ata Declaration and the Health for All 2000 strategy, UNICEF initiatives in the 1990s have begun to address key social factors and the situation of women and children in especially difficult circumstances, such as armed conflict and socioeconomic neglect.¹⁰⁷ Currently, along with the elements listed in the prior paragraph, the GOBI-FFF program includes safe water and sanitation, maternal health and survival, elimination of micronutrient deficiency, control of acute and chronic diseases, and protection of children in difficult circumstances. More recently, and as advocated in this paper, UNICEF has noted, "survival, growth and psycho-social and cognitive development are three intimately intertwined processes directed toward the overall well-being of the child."^{108, 109}

Rosen points out that the ILO has recently begun working with three countries—Tanzania, El Salvador, and Nepal—to try to design an integrated, time-limited program to tackle child labor.¹¹⁰ These countries offer an opportunity with which to test a coordinated approach integrating research, advocacy, and problem solving on the international and national level regarding child labor and the right to health. The ILO/IPEC program in Costanza, Dominican Republic, includes an awareness-raising campaign with a health message. Medical attention received by the children has included complete medical check-ups, treatment of skin and respiratory problems, treatment for parasites, vaccination, and medication, as well as friendly conversation and advice on bathroom cleanliness and personal hygiene."^{111, 113} Such an approach is clearly in keeping with the Alma Alta Declaration and programs such as GOBI-FFF. The sustainability of any such program always needs to be considered.¹¹⁴

The delivery of some health services such as vaccination can be incorporated into the school day. If the school is attractive in other respects, this could serve the dual purpose of helping give children an additional reason to attend school, thereby removing them from the workplace during school hours. Health care can also be incorporated into programs to address children outside of the school environment, not only where there is an obvious need, but also as a means to build support among clients for the program itself.

For example, one program to help garbage scavengers working at a dump in the Philippines began with a drop-in center for child workers. Because the drop-in center was a central location that many children entered, the drop-in center began to offer first aid and vaccinations against tetanus, which is a significant health problem in dumps. The ILO published a report about the project in 1989, saying that five children scavenging in the dump recently had died from tetanus. The drop-in center also provided fresh water, which otherwise the children would have had to purchase. Although organizers stressed that health services must be provided by government and other infrastructure in the longterm, the delivery of health care in the shortterm helped win support for the rest of what became a comprehensive program of aid to the children and their families.¹¹⁴

Regrettably, even the best efforts may be thwarted if the public health (or educational) structure is inadequate and unable to respond to ongoing and emerging needs. Uganda, for instance, has a Public Health Act that is so outdated it contains provisions related to colonial government. In the allocation of public funds, public health care programs must compete with education, thereby shortchanging both these vital services.¹¹⁵ Such competition is clearly not in the best interests of the poor and working children and points to the need for policies that integrate programs against child labor at all levels.

A coordinated effort will be needed to determine all types of work and work conditions that should be considered hazardous, and what should be done about them. This effort should include policymakers, but also public health practitioners, educators, occupational health physicians,

pediatricians, and child's rights advocates. A coordinated effort might broaden the scope of what has traditionally been considered dangerous for children and provide more suitable and lasting interventions.

For example, as stated earlier, it is likely that work in stone quarries or crowded conditions places children at considerable risk of developing tuberculosis, despite established medical knowledge about ways to prevent tuberculosis and, when individuals contract the disease, effective chemotherapy to cure it. These chemotherapy regimes have been known for at least 50 years.¹¹⁶ It is also likely that other infectious diseases threaten the lives of working children who are most often poor and suffer neglect or violation of their rights.¹¹⁷

New work to establish public health protections for children who are now working in harmful or hazardous occupations, or are at risk of starting such work, should bring together international and national medical and public health associations, as well as Ministries of Health and Ministries of Education. For programs to become sustainable, they will need to be integrated into both the public health and educational systems of communities. Anker has argued that the magnitude of the child labor problem is too large to create a multitude of unique programs, and so existing programs should include considerations of child labor.¹¹⁸ For example, nutrition and basic health care can be readily integrated into school programs. They then serve a dual purpose of helping children attend school and providing adequate food and health care. Such an approach is clearly in keeping with the Alma Alta Declaration and programs such as GOBI-FFF. In addition, a critical aspect of program effectiveness—sustainability—needs to be considered. UNICEF defines this as the capacity for a system to effectively maintain its goals over time with minimal external input.¹¹⁹

International and national agencies should make research on child labor and public health a greater priority. There is a dearth of good data on the impact of child labor on health and studies that examine the integration of public health campaigns with campaigns for child rights and against child labor. In the future, the compilation of data on

child laborers should provide a broad social and demographic context with which programs directed against child labor may be developed and monitored.

In 2002, the ILO Director-General's report will focus on the "worst" forms of child labor as stated in Convention 182. This offers an opportunity to more thoroughly address critical human rights concerns and health problems facing child workers in hazardous industries.¹²⁰

Conclusions

Child labor is a problem with significant consequences for the health and rights of children. Young workers are at substantial risk of developing both work-related and non-work-related illness, especially in occupations that could be classified as the worst forms of child labor. Children's poor nutritional status and other basic health conditions are often compounded by hazardous or harmful work conditions. Although data on the toxic effects of occupational exposures to children is limited, existing disease models amply support the hypothesis that many children will develop disease or be injured at an early age as a result of inappropriate work. Disease models also support the hypothesis that the impact of child labor on health may be part of an intergenerational cycle of poverty.

Programs to eliminate detrimental child labor must be integrated into public health programs, drawing attention to larger economic, social, and cultural and political issues. Programs to provide support to child laborers may also positively affect large segments of a community. The relationship of child health to community health and well-being draws attention to the need to include public health and educational goals and rights-based approaches in the planning, development, implementation, and evaluation of new programs. In keeping with the principles of the Education for All world conference in 1990, and the follow-up World Education Forum in Senegal in 2000, special consideration needs to be given to the needs of girls.^{121, 122, 123}

Detrimental children's work is in itself a transgression of human rights. Detrimental children's work is both a cause and a consequence of the neglect and violation of chil-

dren's rights and children's health. This, in turn, may exacerbate public health and education problems for the larger community. By 2020, some 730 million people will enter the global workforce. They, and the majority of the total workforce, will have been born in and/or reared in developing nations.¹²⁴ If these workers are harmed, if their rights and health are compromised, or their growth and development is hampered by detrimental child labor, the consequences will be felt not only in their countries of birth, but in all the countries of the world.

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