

Challenges in Determining How Child Work Affects Child Health

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SYNOPSIS

Credible findings from well-crafted research studies are essential in assessing the impact of child work on children's health. Researchers, however, encounter significant challenges in defining the relevant group of workers for a study and identifying an appropriate comparison group. This article describes some of those challenges and explains how choices about study and comparison groups can lead to biased research results. When selecting study groups, researchers should be aware that the impact of work on health may depend on the type and intensity of the work, and on the context in which it occurs. They should avoid drawing conclusions about the health effects of particular work situations from studies of very heterogeneous groups of workers and should not overgeneralize from studies of more homogeneous groups. When choosing comparison groups, researchers should select children whose health outcomes are likely to be comparable to the outcomes working children would experience if they did not work. In particular, researchers should attempt to find children who are similar to the workers of interest on relevant non-work characteristics, including socioeconomic status and levels of parental education. In addition, they should consider the extent to which healthier children are more likely to select into the labor force as a result of decisions by parents or employers, or due to their own greater fitness. Ideally, studies of the health effects of child work should use multiple comparison groups, including children who work in relatively safe, non-strenuous occupations.

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The 1999 International Labour Organization's (ILO) Convention 182 calls for the elimination of the worst forms of child labor.¹ Convention 182 defines these *worst forms* as involving children younger than age 18 in (a) slavery, bondage, and other forms of forced or compulsory labor; (b) prostitution or the pornography industry; (c) illicit activities, such as the drug trade; and (d) "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" [emphasis added].¹

How can authorities know whether work is likely to harm children?

The perceptions of children may not be reliable guides. Children are subject to many situations and conditions, which, if asked, they may describe as harmful to themselves. Many children object to going to school or doing homework. Even more dislike doing chores. In the case of work, children may wish to avoid tasks and conditions that they dislike, but that do not cause them serious harm. A child's objection does not always imply that a situation is unacceptable.

Child workers may fail to perceive harm when it is present. They may accept or even embrace situations that hurt them because they do not know about the hazards to which they are exposed. For example, children who work in agriculture may be unaware of the negative health consequences of pesticide exposure.² Those whose work conditions put them at risk for long-term illnesses or growth deficits may not recognize these problems until they have already been working for many years.³

The perceptions of adults are also an imperfect gauge of the harm caused by child work. The literature on child labor abounds with discussions of the poor conditions under which children work and the hazards of work. The underlying tone of these discussions implies that adults know what is bad for children—that the negative health effects of child labor are self-evident. Yet, as some researchers and professionals have pointed out, exposure to risks and hazards does not inevitably lead to negative outcomes for children.⁴ The context in which work occurs and the resources children bring to work influence the extent to which adverse conditions damage health. Thus, common sense and good intentions must be joined with careful research if authorities are to determine when work is most likely to cause harm.

AVOIDING BIAS IN STUDIES OF CHILD LABOR AND HEALTH

This article highlights the need for systematic studies to enable authorities to decide whether particular types of work are hazardous for children or not. We do not address many important topics concerning the health effects of child work, including the difficulties of measuring the prevalence, duration, and severity of injuries, physical illnesses, mental illnesses, and moral damage; the effects of early work on adult health;⁵ or the impacts of such work on the broader community or the rights of the child.⁶ Nor do we discuss difficulties with drawing probability samples, constructing good survey questions, recall bias, and related concerns.^{7,8} Instead, we focus on the complications posed by various kinds of bias that make studying the effects of child work on child health especially difficult. Our most important point is that re-

searchers cannot simply compare child workers and nonworkers to reach a conclusion about the impact of work on child health. While there is a fundamental need for a baseline or reference group for comparison purposes, the health outcomes of nonworkers may not be comparable with the health outcomes that working children would experience if they did not work.

Many authors have recognized the complexities inherent in studying the health effects of child work;^{2,4,9} unfortunately, complex research involving human beings requires substantial funding to generate credible results. Lacking such funding, most researchers have been forced to use samples of convenience and few have been able to identify fully satisfactory comparison groups.^{6,10} Even in industrialized countries, large-scale, systematic studies are lacking.¹¹ The discussion below describes forms of bias that arise in defining child workers as a group and arranging comparison groups. While we recognize that many of these complex issues must, by their nature, be overlapping, the categories provide a useful framework for thinking about the complex relationship between child labor and health.

The issues we discuss are often summarized using the term, "selection bias." In this context, *selection bias* is present whenever there are systematic differences between nonworking and working children that are unrelated to work. For example, working children, if they are in school, are often found to have lower test scores than non-working children.¹²⁻¹⁴ However, it would be wrong to say that working leads to poor test outcomes, based simply on that information. It may be that children with less scholastic aptitude "select into" the state of working, while more intellectually capable children remain in school. Before making any causal statement about the link between work and school, one would have to use statistical techniques to take account of the selection bias. Gunnarsson et al. provide an example of how this may be done.¹⁵

Although many of the points we make in this article are related to issues of selection, others are not. For example, for any particular study, a research design must identify which children are the child workers whose health is of primary interest and concern. While this choice may lead to particular biases—for example, a gender bias—they are not selection biases. In general, a procedure that generates a *bias* is one that produces an estimate that is systematically higher or lower than the underlying parameter (the "true" value).

We will refer to work that is likely to harm the health, safety, or morals of children as *hazardous work*. This contrasts with terminology currently used by the ILO and United Nations International Children's Emergency Fund (UNICEF), where *child labor* refers to hazardous work and *child work* refers to non-hazardous work. (Among other problems with this terminology, *work* and *labor* cannot be differentiated in many languages.) We will exclude from our discussion illicit forms of work, including prostitution, bondage, and drug trafficking. Although these types of work pose unique challenges to researchers interested in child health, they are clearly hazardous and are therefore outside the focus of this article.

The remainder of this article is divided into a discussion of issues that arise in the process of defining a study's

population of interest (also known as the study or treatment group), those that arise when defining the comparison group (also known as the reference or control group), and concluding comments.

DEFINING THE POPULATION OF INTEREST

To determine the effects of work on children's health, researchers must determine who, among individuals aged <18, are "workers." Children engage in a variety of activities that may or may not be defined as work, depending on the task, its duration, and its intensity. The context in which activities take place also may determine whether these actions are defined as work. To define the population of child workers relevant for a particular study, researchers must determine which tasks, under which conditions, constitute work.

In identifying their population of interest, researchers must balance problems of inclusion with problems of exclusion. If they include in their studies children engaged in a wide variety of tasks, their study groups will be heterogeneous. Substantial heterogeneity in the workers studied may mask differences in the health effects of different types of work, making it difficult for researchers to draw accurate conclusions about any particular type of work. If, on the other hand, researchers narrowly define their experimental groups, they risk ignoring harm caused by forms of work that are excluded. In addition, consumers of very focused studies may inappropriately generalize about the effects of child work from research that does not support broad conclusions.

Productive vs. reproductive work

Many studies focus on labor force workers as they are traditionally defined by labor force surveys: those children who engaged in labor force activity for at least one hour in the reference week. This definition is broad, including "persons who, during the reference period, performed some work for profit or family gain, in cash or in kind."¹⁶ Thus, children engaged in traditional labor force activity are doing work that is considered "productive."

A broader definition of work includes so-called "reproductive" work—that is, unpaid work that sustains family life. For example, a child who cooks in a market stall is counted as a labor force worker, but a child who cooks at home for her family's consumption is not. Cooking in either environment may be hazardous.

Although researchers may recognize that many, perhaps the majority, of the children who work are performing "chores" in their own homes, counting these children among child workers is often beyond the scope of their studies. Such researchers should be aware that by focusing on "productive work," they may be excluding much of the work done by girls (Unpublished manuscript, R Assaad, D Levison, N Zibani, The effect of child work on schooling in Egypt, 2004.)^{17,18} That is, there may be a gender bias: in contexts where labor market work is predominantly done by boys and household work is predominantly done by girls, prioritizing labor market work and its hazards means implicitly placing more value on boys' health as compared with girls' health.

In addition to gender bias, the exclusion of children

doing unpaid "reproductive work" can lead to another kind of bias. Imagine a situation where the predominant types of labor force work are detrimental to children's health, but so are some kinds of domestic tasks. A researcher interested in assessing the health effects of work defines her study group as including only labor force workers; the health status of this group is then measured. The researcher defines her comparison group as including children who are not doing labor force work—but who are doing "chores," possibly for many hours. Their health status is measured as well. The difference between the health of the two groups is then attributed to work. However, this differential will be smaller than if the comparison group truly excluded all working children—the measured effects of work on child health will be biased downward.

The size of the downward bias is important. If there is a big difference between the comparison group that includes children who do chores and a comparison group that excludes children who do chores (or at least substantial amounts of chores), then the size of the bias is large. In some cases, the bias may be large enough to mask substantial effects of work on health, leading researchers and policy makers to conclude that there are no important health impacts in this particular case.

When researchers allow the decision about the study group to simultaneously define the comparison group, i.e., anyone who is not in one group is in the other, they may inadvertently "contaminate" the comparison group with children whose activities could reasonably be defined as work. The resulting bias may lead them, as in this example, to underestimate the damage work causes to children's health. In other cases, the inclusion of some working children in the comparison group may lead researchers to underestimate the positive health effects of child work. With each decision they make about their study groups, including those discussed in the remainder of this section, researchers may open the door to this type of bias. At each step, they should consider the potential for such bias, its likely direction, and strategies to keep it at a minimum.

Children's employers: family members vs. non-relatives

Despite the stereotypical image of children at work in factories, family businesses are a more typical setting for child work. Data from surveys conducted by UNICEF in more than 30 low-income countries suggest that only 2.4% of children in those countries work outside their household for pay.¹⁹ In contrast, 22.0% of children in the survey countries work for a family business or farm.¹⁹ As Edmonds and Pavcnik observe, "Parents are the number one employer of children."¹⁹

Sometimes researchers may be able to focus on children working for family members or on children working for non-relatives. Researchers should be aware, however, that either group will usually include only a portion of the universe of working children. Generalizations from such a focused sample to the universe of all working children will imply a variety of context-specific biases. If both groups are included in the same study, then different protocols may be required for encounters with family (often parents) and non-family employers.

Exclusion of married children

Many researchers choose only non-married children for their studies, often as part of an effort to include information on the children's parents. Early marriage, however, affects girls disproportionately, so excluding married children will lead to gender-related biases in parts of the world where early marriage is prevalent. Among girls in West Africa, South Asia, and East and Central Africa, 30% or more are married by ages 15 to 19.²⁰

Street children

The term *street children*, rather than being a scientific term, grew out of the desire of non-profit organizations to bring attention to the plight of poor children, and thereby raise funds to help them. Many children can be seen on the streets of cities in poor nations. The majority of children working "in the street" have families and homes to which they return at night; in some countries, many also attend school and work when school is not in session. Other children are more loosely attached to families and go home irregularly. Another group of children truly live on the street—they work, play, socialize, and sleep on the streets of cities and towns. Frequently, such children have run away from violence or neglect from the adults in their lives.²¹ Whenever possible, researchers should control for the degree of connection between children and their families, not only because the amount of resources and support available to children may affect their health, but also because living with violence and neglect may have degraded their health independently of work.

Binary vs. complex definitions of work

In many statistical studies, children are classified either as workers or nonworkers. The health effects of work, however, are likely to differ depending on the type and intensity of the work. Should we be concerned, for example, about children who work only a few hours per week—concerned enough to include them among child workers? Should we worry about children who engage in relatively safe, non-strenuous activities? Work has multiple dimensions, and researchers should strive to design studies in ways that accommodate a multidimensional definition of work. The importance of complexity can be seen in many of the issues we discuss below.

Intensity—hours of work. In some cases, child work may become hazardous only when surpassing particular intensity thresholds. Indeed, weekly hours worked is one of the most common proxies for exposure to risk. In the United States, "Twenty hours per week is widely considered a level above which work becomes 'excessive' and deleterious for adolescent development."²² In poor countries, labor force surveys provide evidence that, among children who work, average weekly hours can be very high. For example, in the city of São Paulo, Brazil, 13- to 14-year-olds who were employed worked an average of 35 hours per week in the late 1990s (Unpublished manuscript. Levison D, Hoek J, Lam D, Duryea S. Implications of intermittent employment for child labor estimates; 2003). Typically, such labor force surveys observe

individual children working a wide range of hours, from one or two hours per week to 60 or 70 hours per week. Clearly, these numbers indicate something about different levels of work intensity.

While weekly hours of work is the most common operationalization of intensity, other measures can be used, either alone or in conjunction with weekly hours. In a rare longitudinal study of American adolescent students, Mortimer et al. considered multiple dimensions of work. Their measure of "duration" of work was based on each student's total months of paid work while school was in session, and their particular measure of intensity was computed by dividing total hours worked during the school year by the total weeks worked by a student during the school year.²² Depending on the context, other measures of intensity may be appropriate, including, for example, daily hours worked, continuous weeks worked where weekly hours exceed a given threshold, and so on.

Intermittency of child work. The seasonality of adults' work is amplified for children, who are more likely to be out of the labor force during off-peak times than adults—even if they work during peak seasons, such as planting and harvesting. In addition, even in jobs without seasonal peaks, children's work can be much more intermittent than that of adults (Unpublished manuscript. Levison D, Hoek J, Lam D, Duryea S. Implications of intermittent employment for child labor estimates, 2003). Both seasonality and intermittency make defining the study group challenging. One-time surveys may identify a child as a non-worker because she was out of the labor force in the reference week—even though she may have been employed the previous week, and she may become employed again the following week. A study conducted in urban Brazil found that children move in and out of the labor force at a much higher rate than older adolescents and adults, so that longer reference periods define a much larger percentage of children as workers (Unpublished manuscript. Levison D, Hoek J, Lam D, Duryea S. Implications of intermittent employment for child labor estimates, 2003). Moreover, "because they move in and out of the workforce frequently, hours of work at any particular time may be a poor indicator of their investment in work over a longer period. But such cumulative, long-term work patterns may be far more consequential for development and attainment."²²

Type of work. Even within the context of labor force work, children are engaged in many different types of activities, with varying levels of risks and hazards. For example, one hour of work involving heavy machinery may lead to an injury, whereas one hour spent weeding a garden seems unlikely to be detrimental (in the absence of chemical agents). Studies combining workers engaged in these tasks would have such a heterogeneous population of child workers that they could not accurately assess the health effects of either type of work. In areas with sufficiently large numbers of child workers in one occupation, such as garbage-scavenging or brick-making, researchers may be able to limit the study population to that occupation. In other cases, large samples may allow researchers to capture population heterogeneity by allowing the analysis of subgroups.

DEFINING THE COMPARISON GROUP

Much child work occurs where baseline measurements of children's health—whether or not they are working—are already low. Often, “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.”⁶ In conditions such as these, evidence of poor health among working children is not necessarily evidence of deleterious consequences of work; injuries, illnesses, and mental health troubles may be a result of the larger environment.

In assessing the impact of child work on health, researchers face a problem: it is impossible to determine what the health of working children would be if they did not work. Researchers most often approach this problem by trying to compare child workers with “comparable” nonworkers. It is difficult, however, to determine who is comparable.

At the time they begin working, the health of children who work may be better or worse than the health of children who remain outside the labor force. The conditions in which children live are likely to influence both their health and the likelihood that they engage in work. In addition, a child's health status itself may influence the chances of working, as discussed below.

If the health of child workers differs systematically from the health of non-workers for reasons unrelated to work, then non-workers provide an inaccurate picture of the health outcomes working children would experience if they were not in the labor force. More careful and sophisticated studies are needed. Researchers must carefully consider their choices of study and comparison groups, and, wherever possible, they should make use of statistical techniques designed to address selection problems. When these efforts fail, researchers should acknowledge the limitations of their results.

The following subsections describe systematic reasons unrelated to work that indicate why working children may be more or less healthy than nonworking children, at any time. Researchers concerned with occupational safety and health have observed that, because injuries and illnesses may prevent labor force participation, workers are often healthier, as a group, than nonworkers. Circumstances that may contribute to this “healthy worker effect” among children are summarized in the first subsection. The second subsection presents reasons—most important, those due to limited social, economic, and educational resources—why children who work may be in poorer health than children who remain out of the labor force. The items in these two sections should not be viewed as mutually exclusive. Indeed, it is likely that children from disadvantaged backgrounds are more likely to seek work than children with greater resources, but that, among the less privileged children, those who are healthiest are most likely to be employed.

While there may be many idiosyncratic reasons why the health of child workers differs from the health of non-workers, only systematic reasons lead to bias about which researchers need to be concerned.

Systematic reasons unrelated to work

Why working children may be healthier:

- Employers may engage in “creaming”—choosing healthier children to be workers and leaving less healthy children unemployed.
- Parents may be more likely to select robust children for work and to keep more delicate children in school or at home.
- Healthier children may have more energy to look for jobs or to engage in tasks for a family business.
- Healthier children may be more likely to keep working, once employed. They may be less likely to suffer injuries or more able to endure the demands of employment.
- In some contexts, boys may have greater labor force opportunities than girls and receive larger shares of their families' resources, such as food. Studies that compare labor force workers (mostly boys) to nonworkers (mostly girls) may confound the health effects of intra-family resource allocation with the effects of child work. (However, in some regions, for example, those with a large proportion of employment in the textile industry, girls may be the majority of labor force workers.)

Why working children may be less healthy:

- Children who work tend to be socioeconomically disadvantaged and, as a result, may have poorer health than nonworkers prior to entering the labor force. It is often said that children work out of necessity, because their families are poor and have pressing needs for food and other essentials of daily life. In the big picture, this is indeed the case: in poor countries, most children who do labor force work do not come from middle class or wealthy families, although there are important exceptions in farming families. Instead, most employed children come from families with low incomes and little, if any, wealth. Such children may have had little, if any, preventative health care; they may be currently undernourished or may have developmental deficits due to past malnourishment; they may be anemic due to iron deficiency; they may have intestinal worms; and so forth. Because their non-employed peers are less likely to be poor, their health is less likely to have been compromised in these ways. Thus, comparisons of workers and nonworkers that do not control for socioeconomic status are unlikely to be useful.
- Independent of economic disadvantage, children who work may be more likely to be children of illiterate or minimally educated parents. Study after study evaluating the determinants of child work finds statistically significant and often sizeable effects of maternal, and sometimes paternal, education on children's work status, even when controlling for various dimensions of socioeconomic status. Parents with lower levels of education are less able to use available resources to enhance their children's health.

- Parents may choose to keep their strongest, most robust children in school, especially if education provides the best chance for upward mobility and future security. Less physically robust children may be given the less promising alternatives, including labor force work.

CONCLUSION

Studying the effects of child work on health outcomes is complicated at many levels. In this article, we have focused on some of the many decisions necessary in defining study groups, likely biases that are linked to particular decisions, and the challenges of defining comparison groups.

Even very well-intended researchers have unrecognized and therefore unacknowledged beliefs that affect the conclusions and, perhaps, the usefulness of their studies. For example, it is not appropriate to compare the health of poor working children to the health of nonpoor nonworking children. Poor children face a more limited set of alternatives, and the great majority of working children are poor. In practice, there is no ideal comparison group for studies of child workers. When resources permit, however, researchers can improve their studies by including multiple, carefully chosen comparison groups. When possible, they should assess the health of nonworking children living with the realities of the alternatives faced by child workers—including possibly having less to eat, being idle, spending long hours in sometimes hazardous household work, and/or being married young. In addition, researchers should compare the health of children employed in relatively hazardous occupations with the health of children working in safer or less strenuous environments to minimize the healthy worker effect bias. Although actual comparison groups are often far from the ideal, thoughtful planning can minimize some biases and make it easier to predict the directions of others.

One difficult issue, which we have sidestepped here, concerns the unit of observation. Presumably the child worker in the study group is the unit of observation, and this must be so in the case of physical examinations. Yet, many studies of child workers do not, in fact, elicit further information from the children themselves; instead, parents and employers are interviewed. Because adults are important sources of information in most studies of child work, even carefully chosen study and comparison groups—which are composed of children—do not completely define the pool of respondents for a given study.

Researchers who rely on adults, rather than children, to provide information about child work may do so because they do not believe that children can accurately describe their experiences or because cultural norms or a lack of privacy make it difficult for adult interviewers to have private conversations with child respondents. Researchers may also be reluctant to include children in their studies because the research techniques with which they are familiar were developed for adults and must be adapted before they can be used with children.²⁵

Although there are legitimate reasons to include parents and employers in studies of child work, the responses of adults are likely to reflect their own biases and inaccura-

cies.²⁴ Parents, for example, may view dull, repetitive work as training for adult employment; children may view this same work as simply tedious. Parents also may not know what children do when they are out of sight.²⁵ Employers may report that they provide child workers with adequate nutrition and favorable working conditions, even when they do not. Because adults and children have different perspectives on child work, researchers stand to gain valuable insights by including children, as well as parents and employers, in their studies.

It is clear that more research is needed to help advocates and decision makers identify the forms of child labor most likely to damage health. If new studies are to enhance our understanding, however, governments, foundations, and others who control resources must acknowledge the difficulties involved in child labor research and fund research projects accordingly. Investments in solid, well-crafted studies will ultimately enable authorities to target policies and interventions at the most pernicious forms of child work.

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