

# Parental Beliefs about Vaccination among an Ethnically Diverse Inner-City Population

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To characterize the knowledge and attitudes of an ethnically diverse group of inner-city parents regarding childhood immunizations, we conducted structured telephone interviews with 102 primary caretakers at an academic ambulatory pediatric practice during the winter of 2001–2002. The sample was ethnically diverse, with 36% African-American, 41% Hispanic, and 15% white. Half the households had infants or toddlers in the home, and 36% had children with conditions placing them at high risk for influenza. Almost all parents felt that their children should be immunized against diseases in general (98%), but significant proportions also believed that children received more immunizations than necessary (23%), that immunizations could weaken a child's immune system (36%), or that the influenza vaccine could itself make a child ill (48%). Younger parents, those with infants, and parents of children at risk for complications of influenza were less likely to hold these beliefs while race/ethnicity, marital status, parent's education, or socioeconomic status could not be shown to have any effect. We conclude that many inner-city parents question the effects of childhood immunizations and hold erroneous beliefs about them irrespective of age, race, socioeconomic status, or educational background. Practitioners should address these beliefs in efforts to diminish disparities in immunization levels associated with inner-city multiethnic populations.

**Key words:** vaccination ■ influenza ■ inner-city

## INTRODUCTION

Approximately 400,000 illnesses and 30,000 deaths per year are caused by diseases that are preventable through immunization.<sup>1</sup> Ensuring high levels of vaccination early in childhood is not only the key to preventing the spread of vaccine-preventable diseases in the young, but it is also essential for controlling these same diseases in the adult population. Augmenting national immunization rates makes up many of the national health objectives listed in Healthy People 2010.<sup>2</sup> One of the stated goals for 2010 is to achieve 90% coverage for each of the routinely recommended childhood vaccinations. Although many states have exceeded 90% coverage for children aged 15–35 months, coverage of certain subgroups of the population is much lower.<sup>2</sup>

In order to achieve 90% immunization coverage rates for children, regardless of locale, socioeconomic status, and race, numerous barriers to immunization must be recognized and surmounted. Historically, underimmunization has been associated with factors, such as low socioeconomic status, urban setting, and minority racial status.<sup>3</sup> However, both supply-and-demand determinants need to be considered in any comprehensive analysis of immunization rates. Supply barriers include actual vaccine supply and delivery, provider practices, and third-party coverage for costs.<sup>4,5</sup> Demand barriers that have been studied and implicated as reasons children are not vaccinated include parental factors, such as low socioeconomic status, young parental age, limited parental education, and nonwhite race.<sup>3,7–11</sup>

Among demand issues, an important area is parental knowledge and beliefs. Given the difficulties in achieving high rates of immunization among disadvantaged groups and the explicit goals of Healthy People 2010 to diminish the disparities in health outcomes,<sup>6</sup> it is surprising that little is known about the attitudes of parents of multiethnic and socially disadvantaged populations.<sup>7,10,12</sup> Therefore, this study aimed to examine parental knowledge and beliefs towards routine childhood vaccinations in general and the

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influenza vaccination in particular among a group of inner-city, multiracial, lower-socioeconomic caregivers. We intended to explore the prevalence of beliefs that would adversely affect the probability of receiving recommended vaccines in a timely manner. Specifically, we hypothesized that beliefs in the lack of necessity or potential harm of vaccinations would be prevalent among this population of caregivers with vaccine-eligible-aged infants and children.

**METHODS**

In this pilot study we conducted during an eight-week period from December 2001–January 2002, a locally representative telephone survey of 102 parents and legal guardians of patients enrolled in an inner-city academic ambulatory pediatric practice in the Bronx. The practice serves an ethnically diverse population of families from the southeastern Bronx among whom more than 80% are either Medicaid or Child Health

Plus eligible. Households were selected from a database of asthmatics and well-child visits to recruit a sample of patients both with and without conditions placing them at high risk for complications from vaccine-preventable conditions, such as influenza. The databases were restricted to patients with birthdays from 01/03/83 to 11/02/01. From each of the two databases, every third patient’s household was selected for inclusion in the study. Households were eligible if there was an English-, Spanish-, or French-speaking adult at home who was the parent, primary caretaker, or legal guardian. Households contacted with Arabic (2%), Italian (2%), and Russian (1%) speakers also had English speakers at home so that Spanish, French, and English exhausted the foreign languages necessary to administer the survey to all participants. Respondents were informed that they were being contacted to ask them questions regarding their feelings about childhood immunizations. After informed consent was obtained over the telephone, interviews were conducted that consisted of 38 multiple-choice and graded-response questions lasting 10 minutes (survey available upon request). For households with more than one child of the eligible age, one of the eligible children was chosen at random about whom the survey questions were asked. The purpose and format of the study was approved by the Institutional Review Board (IRB) of Montefiore Hospital in Bronx, NY.

Univariate and bivariate analyses were performed using Chi-squared tests to compare proportions and to compare graded response data. In some instances, graded response variables were dichotomized for analytic purposes. Differences were considered statistically significant at a probability value of less than 0.05.

**Table 1. Characteristics of Respondents**

|                                     | N  | %    |
|-------------------------------------|----|------|
| <i>Age of Respondent</i>            |    |      |
| ≤25                                 | 25 | 24.5 |
| 25-35                               | 28 | 27.5 |
| >35                                 | 49 | 48   |
| <i>Race/Ethnicity</i>               |    |      |
| African-American                    | 37 | 36.3 |
| Hispanic                            | 42 | 41.2 |
| Caucasian                           | 15 | 14.7 |
| Other                               | 8  | 7.8  |
| <i>Education</i>                    |    |      |
| < High school                       | 8  | 7.8  |
| High-school degree                  | 46 | 41.2 |
| Some college                        | 42 | 41.2 |
| Graduate school                     | 6  | 5.9  |
| <i>Household Composition</i>        |    |      |
| Living with other biological parent | 62 | 60.8 |
| <i>Socioeconomic Status</i>         |    |      |
| Receive public assistance           | 26 | 25.5 |
| No public assistance                | 76 | 74.5 |
| <i>Number of children</i>           |    |      |
| ≤2                                  | 65 | 63.7 |
| >2                                  | 37 | 36.3 |
| <i>Age of children</i>              |    |      |
| Infant (≤1 year)                    | 30 | 29.4 |
| Toddler (2–4 years)                 | 21 | 20.6 |
| School age (5–12 years)             | 35 | 34.3 |
| Adolescent (13–21 years)            | 16 | 15.7 |
| <i>Health Conditions</i>            |    |      |
| No predisposing condition           | 65 | 64   |
| Asthma                              | 35 | 34.3 |
| Sickle cell disease                 | 2  | 2    |
| Cardiac disease                     | 1  | 1    |

**Table 2. Parental Beliefs about Vaccinations**

|  | Agree % (N) | Disagree % (N) |
|--|-------------|----------------|
| Children should be vaccinated against diseases in general.   | 98 (100)    | 2 (2)          |
| Children should only be immunized against serious disease.   | 46.1 (47)   | 53.9 (55)      |
| Children receive more immunizations than necessary.  | 22.5 (23)   | 76.6 (78)      |
| Immunizations, such as the influenza vaccine, are always proven safe before they are used in a clinical setting. | 77.5 (79)   | 18.6 (19)      |
| Your child’s immune system could be weakened by too many immunizations.  | 37.3 (38)   | 60.8 (62)      |
| Your child could get sick from the influenza vaccine itself.   | 48 (49)     | 51 (52)        |

## RESULTS

Of 281 households contacted, 102 parents and/or guardians consented to participate (36%). Of nonresponders, 72 could not be reached on three attempts, 87 numbers were disconnected, two households could not be interviewed secondary to language barriers, and 18 refused participation. Of contacted households, 69% spoke exclusively English at home; 23% spoke Spanish; and 2% each spoke French, Italian, Russian, or Arabic.

Characteristics of the sample are summarized in Table 1. Of note, 36% of households had more than two children, and half of all households had infants or toddlers, suggesting a high probability of recent exposure to the issue of immunizations. Furthermore, 36% of respondents' children had conditions placing them at high risk for complications of influenza, asthma being the most common (35 of 38, or 92%).

The survey revealed several beliefs that reflected a degree of parental disquiet with respect to vaccination practices. These are summarized in Table 2. Twenty-three percent felt children received more vaccinations than necessary, and 37% believed that too many vaccinations could weaken his/her child's immune system. Only 78% of parents were convinced that immunizations, such as the influenza vaccine, were proven safe prior to being used in the clinical setting. Furthermore, 49% thought that their children could become sick from the influenza vaccine itself.

Although no correlations were found between the previously mentioned beliefs and the degree of education of the parent or receipt of public assistance, certain other characteristics of respondents and their children *were* found to be associated with the beliefs about immunizations (Table 3). Compared with older parents or caregivers, respondents age 25 and younger were less likely to think vaccines can weaken a child's immunity and were more inclined to

believe in vaccine safety (OR=0.42,  $p=0.09$  and OR=7.85,  $p=0.02$ , respectively). Respondents with infants ( $\leq 1$  year old) or fewer than two children were more likely to disagree with the idea that vaccines can weaken the immune system (OR=0.32,  $p=0.02$  and OR=0.51,  $p=0.11$ , respectively). Parents who had children with medical conditions that placed them at high risk for complications of influenza were less likely to think children were given too many immunizations (OR=0.32,  $p=0.07$ ).

## COMMENT

Despite the fact that the majority of parents living in the underserved, ethnically diverse urban community surveyed in this study believe vaccinations to be an important component in the health maintenance of their children, a considerable proportion had misconceptions about the necessity of all the recommended immunizations, the effects of vaccinations on their children's immune systems, and the safety of vaccines. One-fifth thought children received more vaccinations than necessary, one-third believed numerous vaccinations could weaken his/her child's immune system, and only three-fourths of parents were convinced that immunizations, such as the influenza vaccine, were proven safe. In addition, almost half thought their children could become sick from the influenza vaccine itself. Respondents with infants or less than two children were less inclined to think vaccines weaken the immune system, and parents who believed their children were vulnerable to complications of influenza were less likely to think children receive too many immunizations.

Prior studies have examined parental beliefs and their impact on vaccination rates in other populations. Meszaros et al.<sup>13</sup> reported that perceived dangers of the pertussis vaccine and parental doubts about vaccine efficacy among a randomly selected

Table 3. Determinants of Beliefs

| Demographic Factors                                | Numerous vaccinations can weaken a child's immune system |      | Children are given more immunizations than necessary |      | Vaccines are always proven safe before used clinically |      |
|--|--|------|--|------|--|------|
|  | Odds Ratio   | P    | Odds Ratio   | P    | Odds Ratio   | P    |
| Respondent <25 years                               | 0.42   | 0.09 | 1.46   | 0.47 | 7.85   | 0.02 |
| High-school graduate or less                       | 1.16   | 0.72 | 0.79   | 0.61 | 1.82   | 0.24 |
| Public assistance                                  | 1.11   | 0.81 | 1.36   | 0.56 | 0.54   | 0.26 |
| Black or Hispanic                                  |  |      |  |      |  |      |
| Respondents with infants                           | 0.32   | 0.02 | 1.11   | 0.83 | 0.89   | 0.83 |
| Respondents with <2 children                       | 0.51   | 0.11 | 1.43   | 0.48 | 1.32   | 0.59 |
| <i>Other Determinants</i>                          |  |      |  |      |  |      |
| Child is at high risk for complications of the flu | 1.22   | 0.66 | 0.32   | 0.07 | 1.63   | 0.42 |

population negatively impacted the parents' decisions to vaccinate their children. Other parental misconceptions found to be significant predictors of nonvaccinators in that study were omission bias, beliefs that physicians overestimated the health threat of the disease, perceived ability to influence disease outcomes, and the perceived susceptibility of one's child to the disease.<sup>13</sup>

Another related study by Gellin et al. examined parental understanding of vaccine-preventable diseases, vaccines, and immunization practices.<sup>14</sup> They reported that 25% of parents from a nationally representative sample believed that too many shots could weaken a child's immune system. This result is slightly less than the 37% obtained in the present study. Gellin and colleagues also found that 23% of participants felt children received too many shots, the identical percentage to that obtained in this study. In our study, seventy-one percent of their parents, as compared to 78%, felt immunizations were always proven safe.

Within our sample, we did not find any significant correlation between parental beliefs about vaccination and the race, socioeconomic status, marital status, or degree of education of the parent. This finding contrasts with previous studies<sup>3,16</sup> that have noted lower rates of immunizations to be associated with parental factors, such as poverty, young parental age, nonwhite race, low socioeconomic status, and low parental education levels. By restricting our sample to parents drawn from a low-income clinic population already participating in the healthcare system, we eliminated potential sources of variation that would emerge from a population-based approach. This was by intentional design. Our findings of erroneous beliefs in a sample of parents well connected to a healthcare practice not only apply *a fortiori* to those whose care may be more sporadic but they also point to specific unrecognized counseling opportunities that pediatricians serving these communities already have before them.

Given the present scarcity of knowledge about the attitudes of parents of a multiethnic and socially disadvantaged population, the information in this study may help elucidate some of the reasons higher rates of immunization have not yet been achieved in these communities.

More work needs to be directed toward understanding the knowledge and beliefs of caretakers in the inner-city, urban, multiethnic, socioeconomically disadvantaged community regarding immunizations. Replicating this study using a population-based design will be an important next step. Through continued emphasis on examining the urban, economically disadvantaged, multiethnic communities, more

insight about the low vaccination rates in these areas will be gained. With an increased understanding about these disparities, strategies can be specifically designed to combat the community barriers and augment vaccination coverage.

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