

論文の内容の要旨

論文題目: Immunization status among migrant children in China
—From the data of the 2004 National Immunization Survey

和訳 中国の流動人口の子どもにおける予防接種の現状に関する研究
—全国予防接種調査のデータ分析から

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Introduction

Immunization has been regarded as one of the most cost-effective preventive health measures worldwide. Achieving and maintaining high levels of immunization coverage in whole population, especially in its most vulnerable members of a population is important for control and elimination of vaccine preventable diseases. In China, the routine immunization coverage have maintained higher levels. However, immunization coverage by immunization services and different groups varies widely. In recent years, internal migrants have increased dramatically with the remarkable economic development, and children taken along with their migrant parents have been found to be a particularly vulnerable group that is underimmunized. Given the increasing number and mobility of children taken along with migrants, the immunization status of them matters not only for themselves, but also for the entire society, and therefore, it is an increasing concern in China.

In contrast to many other countries, migration process and migrant definition in China are tightly related to a household registration system or *hukou* system. Generally, children's *hukou* status is inherited from their parents, despite their places of birth or current places of residence. Like other studies, the term "migrant children" is defined in this study as those children without *hukou* status of current place of residence. They are more vulnerable and the reported immunization problems were mainly related to them.

Despite their increasing magnitude and particular vulnerability with underimmunization, information on their immunization status is lacking. Especially, no estimates of immunization coverage among migrant children at the national level were available. Furthermore, the

contributing factors to immunization status among migrant children were not well documented even by several previous studies, because of a small size of study subjects. Thus, using the data of the National Immunization Survey in 2004, this study examined the immunization status among migrant children at the national level.

The purpose of this study was to describe immunization status among migrant children, determine whether disparities in complete immunization coverage exist between migrant and non-migrant children, explore factors affecting immunization status among migrant children in China.

Methods

Data were drawn from the 2004 National Immunization Survey, a latest national survey that provides the nationally representative estimates of immunization status for children born in China between 2001 and 2003 as well as basic demographic information of both children and their parents or caregivers. Totally 155,899 children older than 12 months residing in the surveyed area for at least 3 months were included in the study.

The demographic information of each eligible child was collected by face-to-face interviews with one of the parents or caregivers using a standard questionnaire, and immunization history was abstracted from the child's immunization certificate or immunization record in immunization clinic. Immunization status was defined as complete immunization status if all the required immunizations with the 1:3:3:1 vaccines series (one dose of BCG, three doses of OPV, three doses of DPT and one dose of MV) had been given by age of 12 months. Migrant status of children was dichotomized by whether they have *hukou* status of current place of residence.

The analysis followed two stages with the first stage focused upon a descriptive analysis of immunization status with respect to migrant status and other variables. Differences in proportions and coverage levels were calculated using the chi-square test with at 5% of significance level. Timeliness of individual vaccine immunization was illustrated with the Kaplan-Meier method. The second stage utilized multivariate methods to determine the significant factors associated with complete immunization status. The predictor variables included factors related to child's gender, birth year, birthplace, place of residence, ethnic group, parents or caregivers' awareness, region, and immunization certificate availability. Two sets of models were utilized, with the first including both migrant children and non-migrant children in the model, investigating whether there is difference between two groups with respect to complete immunization coverage. The second set of models focused on migrant children only, enabling the exploration of covariates relative to migrant children.

Utilization and analysis of the 2004 NIS dataset was approved by the National Immunization Program of China CDC. The names of the study children and their parents or caregivers were not included in the available dataset or in any of the findings.

Results

Of 155,899 study children, 150,421(96.5%) were non-migrant, 5,478 (3.5%) were migrant. Compared with non-migrant children, migrant children were more likely to be Han ethnic group, female, live in urban area and eastern region, have immunization certificate, have lower immunization awareness parents or caregivers and receive immunization in immunization clinic.

For each individual vaccine and complete series vaccines, significant differences in coverage were identified between two groups. Among non-migrant children 87.6% were completely vaccinated, while only 78.2% migrant children were. Immunization with each single vaccine was delayed in both migrant and non-migrant children according to the recommended immunization schedule. Vaccination coverage by age for each single vaccine among migrant children was significantly lower than that of non-migrant children during the study period.

The result of logistic regression shows that place of delivery, place of region, place of residence, immunization certificate availability, parents' or caregivers' awareness and birthplace are significant factors associated with complete immunization status among migrant children. Those migrant children who resided in western region or rural area, delivered at home, without immunization certificate, non-locally born and had a caregiver with lower immunization awareness were less likely to be complete immunization status.

Discussion

Observed Disparities in Immunization Coverage

The finding that the complete immunization coverage was lower among migrant children compared with that of non-migrant children is consistent with the results of previous studies. But, the findings of this study would be most reliable because they were estimated based on a nationally representative sample, whereas the previous studies in China have addressed immunization coverage mainly focused on urban areas and limited in sample size.

Timeliness of immunization for each single vaccine

The significant difference in vaccination coverage by age partially supports the disparity in complete immunization coverage between migrant and non-migrant children. Moreover, the delayed vaccinations may leave a group of children vulnerable for a certain period between the vaccine recommended age and completed age, increasing the potential for epidemics or outbreaks of vaccine preventable diseases.

Factors associated with complete immunization among migrant children

An important finding of this study is that non-locally born migrant children were much less likely to be completely immunized than locally born migrant children. The main reasons for such disparity were examined in this study. Most non-locally born migrant children might have moved from an area with lower immunization coverage into an area with a higher coverage.

In the present study, having an immunization certificate was a strong significant factor for being complete immunization among migrant children. Having immunization certificate may imply that

such parents or caregivers of migrant children have a sense of responsibility and positive attitude toward childhood immunization. In addition, immunization certificate availability adds an information source of immunization to caregivers, given there are general knowledge on immunization attached on the certificate.

Awareness level on immunization of migrant children's parents or caregivers was also related to immunization coverage in this study. Those migrant children who have a high-level immunization awareness parents or caregivers are nearly 1.6 times more likely to be in complete immunization than those who have parents or caregivers with low level immunization awareness. This emphasizes the fact that if the information, education, and communication activities on immunization are properly implemented, they can increase the immunization status of children irrespective of the place of region and place of residence.

Some other factors were found associated with complete immunization status among migrant children. Migrant children born at home were found to be less likely to receive complete immunization. The reason might be related to their parents' socioeconomic status. Both place of region and place of residence (urban and rural) influenced complete immunization status among migrant children in this study. Health inequality all over the country might account for these disparities. The access to health services including availability of routine immunization is inadequate in some regions as well as rural areas.

This is the first study that was based on data from a nationally representative survey to assess immunization status among migrant children. The large sample size makes it possible to control for some confounding characteristics to explore difference among variables and also permits the ability to perform stratified analyses in this study. In addition, unlike previous studies, which focus on migrant children in urban area, this study concentrates on all migrant children in the country. Therefore, this study provides more comprehensive view on immunization status as well as information on factors of complete immunization status among migrant children in China.

Based on this study, for improving immunization coverage among migrant children, more attention and efforts are needed for migrant children, especially if they live in western region or rural area. In addition, improving access to immunization and awareness of immunization for parents and caregivers may help to improve immunization coverage among migrant children in China.

Conclusion

This study demonstrates that migrant children are less likely to be complete immunization status in comparison to non-migrant children in China. Migrant children with complete immunization status are more likely to be locally born, have an immunization certificate, be born in health facilities, live in urban area or eastern and central region, and have parents or caregivers with higher awareness on immunization.