**Supplementary material**

**Appendix 1. CHIP 2002, 2007 and 2013 sample size and sample weighting method**

The 2002 survey contains data on 20,544 urban residents (from 6,835 urban households); 37,969 rural residents (from 9,200 rural households); and 5,327 rural-urban migrants (from 2,005 migrant households). The 2007 survey contains data on 14,683 urban residents (from 5,002 urban households); 31,791 rural residents (from 8,000 rural households); and 8,446 rural-urban migrants (from 726 migrant households). And the 2013 survey contains data on 19,887 urban residents (from 6,674 urban households); 39,065 rural residents (from 10,490 households), and 2,210 rural-urban migrants (from 726 migrant households).

Even though the urban and rural samples are sub-groups of the survey, the CHIP 2002, 2007, and 2013 under-sampled urban residents. To make the samples representative, we weighted our analyses such that the urban and rural population shares equal those in the population in each province in 2005, 2007, and 2013 respectively according to statistical surveys conducted by the Department of Population and Employment Statistics of the NBS (National Bureau of Statistics of China, 2006, 2008, 2014). It should be noted that the population surveys before 2005 do not contain population information on migrants. Therefore, for weighting the migrant population in 2002 we therefore used the population proportions of “residents living in the township, towns and street communities with permanent household registration elsewhere, having been away from that places for more than 6 months.”

**Appendix 2. Computation of D-index and HOI**

Adopting the approach of Barros et al. (2009), the D-index and HOI are computed using a three-step procedure. First, we use the following separable logistic regression specification to estimate the conditional probability of access to a given basic opportunity.

$$Ln\left(\frac{P\left(x\_{1},…,x\_{m}\right)}{1-P\left(x\_{1},…,x\_{m}\right)}\right)=\sum\_{k=1}^{m}h\_{k}(x\_{k})$$

where for each child $i$, $I\_{i} = 1$ if the child has access to the basic opportunity and $I\_{i} = 0$ otherwise; $x\_{k}$ denotes the vector of variables representing $k$-dimension of circumstances, hence $x=(x\_{1},…,x\_{m})$. Second, using the predicted probability of access to a basic opportunity for every child, we obtain the average access rate $[\overbar{p}]$ and the D-index $[D]$ using the following equations.

$$\overbar{p}=\sum\_{i=1}^{n}w\_{i}\hat{p}\_{i}$$

$$D=\frac{1}{2\overbar{p}}\sum\_{i=1}^{n}w\_{i}\left|\hat{p}\_{i}-\overbar{p}\right|$$

where, $\hat{p}\_{i}$ is the predicted probability of access to the basic opportunity for child $i$ and $w\_{i}=\frac{1}{n}$ or sampling weight. The D-index is the weighted average of absolute differences between group-specific access rates $p\_{i}$ and the overall average access rate $\overbar{p}$. For instance, if migrant and rural children are the two subgroups and $p\_{s}$ is the average probability that a migrant child will have access to health which is less than $\overbar{p}$, that is, the average probability in the entire population that a child will have access to health, then it suggests that migrant children have a lower probability of having access to health than their rural counterparts. If the equal opportunity principle is consistently applied, an exact correspondence between population and opportunity distribution should be observed. The D-index ranges from 0 to 1 (0 to 100 in percentage terms), and in a situation of perfect equality of opportunity, D will be zero). It is also important to note that the D-index is insensitive to a balanced increase in access rate, which means that if the new opportunities are distributed among circumstance groups in the same way as the preexisting distributions, there is no change in the D-index.

Once the average access rate and the D-index have been estimated, the third step is to compute the HOI $[O]$, which is simply a product of the average access rate and how equitably the access to basic opportunity is distributed across the population under consideration.

$$O=\overbar{p}(1-D)$$

Similar to the D-index, the HOI also varies between 0 and 1. However, as opposed to the D-index for which a lower value implies more equity, a higher HOI is desirable. This is because HOI will be higher only when the average access rate is high, and the inequality in access rate is low. Because the HOI is also distribution-sensitive, it will improve further if the increased opportunities benefit the disadvantaged groups, that is, $D$ is reduced. Despite its distributive sensitivity, the HOI is Pareto-consistent in that an increase in the number of basic opportunities available to any group will always increase the index.