The puzzle of nutrition

• We saw that the poor did not appear particularly hungry for extra calorie, or extra nutrients

• And yet, by all accounts they are still not well nourished:
  – India, 2004, 33% of men and 36% of women were undernourished (BMI below 18.5)
  – Iron deficiency anemia is believed to affect up to 1 billion of people worldwide

• What could be happening?
The role of micronutrients

• Micronutrient deficiency has been described as “hidden hunger”
• A randomized experiment in Indonesia (WISE study):
  – Household were provided iron supplement OR a placebo (why the placebo)?
• Anemia was reduced
• Increase in yearly earnings for self-employed workers who got the supplement and were anemic at baseline: $40
• Cost of fortified Fish sauce for one year:$6
The role of good nutrition in childhood

• Good nutrition in adulthood makes the adult more productive now.
• But good nutrition during childhood is an investment, and may improve wages of the child every year in adulthood for two reasons:
  – Long term impact on health (body may not well recover from deficiencies during childhood)
  – Long term impact through education: children may learn better if they are well nourished.
An Example: Deworming

- Seventy-five of 89 rural primary schools in rural western Kenya (two divisions in Busia district) took part (Figure 1)
  -- Broadly representative of rural Kenya in education, health, worms

- List randomization into three treatment groups:
  -- Group 1: deworming drugs and health education in 1998-2003
  -- Cost-sharing in random subset of schools in 2001

This study tracks down children who were in primary school during the deworming period (group 1 and 2=treatment, group 3=control) in 2007-2009
Courtesy of Sarah Baird, Michael Kremer, Edward Miguel, Joan Hamory Hicks. Used with permission.
Figure 3:
Panel A: The distribution of log labor earnings in the last month, deworming treatment versus control (among those with positive labor earnings)
The EXTRA WAGES EARNED BY STUDENT IN TREATMENT GROUP

Table 3: Deworming impacts on labor earnings (2007-2009)

<table>
<thead>
<tr>
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<th>Dependent variable:</th>
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<tbody>
<tr>
<td></td>
<td>Ln(Total labor earnings, past month)</td>
</tr>
<tr>
<td>Deworming Treatment indicator</td>
<td>(1) 0.191* (0.078)</td>
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<tr>
<td>Deworming Treatment pupils within 6 km (in ‘000s), demeaned</td>
<td>(2) 0.181* (0.077)</td>
</tr>
<tr>
<td>Total pupils within 6 km (in ‘000s), demeaned</td>
<td>(3) 0.242*** (0.092)</td>
</tr>
<tr>
<td>Additional controls</td>
<td>No</td>
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<td>R²</td>
<td>0.060</td>
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<tr>
<td>Observations</td>
<td>710</td>
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<tr>
<td>Mean (s.d.) in the control group</td>
<td>7.81 (0.86)</td>
</tr>
</tbody>
</table>

Courtesy of Sarah Baird, Michael Kremer, Edward Miguel, Joan Hamory Hicks. Used with permission.

The mean in the CONTROL GROUP (in log)
Students earned about 20% extra PER YEAR, for a life time, when the cost is 0.65 cents
The role of nutrition in the womb

• Conditions experienced in-utero have long lasting effects: The Barker Hypothesis
  – Doug Almond found that, in the US, people who were in utero during the big flu pandemics were sicker and more likely to die early
  – *Children of children* born during Chinese famine are smaller
  – Children who were in utero during ramadan earn less as adults
  – Field and Toreror: A campaign to provide Iodine supplementation to pregnant women in Tanzania: higher educational achievement for students who were in utero at the right place and time (when those supplements were distributed)
The potential for poverty trap

• Nutritional investments in micronutrients in adulthood, childhood, and pregnancy, all have returns that are much larger than costs.
• If poor are less likely to undertake the investment, there is a potential for a poverty trap.
• Is it the case?
Are the poor less likely to get the right micronutrients for them and their children

- Most of the poor still consume a diet that is poor in iron
- The vast majority of the world’s children are not dewormed
- WHO estimates that 40% of pregnant women worldwide are anemic (not all that anemia is Iron deficiency anemia).
Is money the problem?

• Very small costs seem to discourage people:
  – Iron fortified fish sauce costs $6 for a year in Indonesia. If the returns is $40, it seems that that investment is worthwhile, and doable even for a poor family.
  – When small cost-sharing was introduced in Kenya in some of the schools (a few cents) take up went almost to zero.
  – In India, a free iron fortification program was introduced in some villages. But it was not at all millers in the villages.
    • Very few people switched to fortifying miller
    • And when they did, if miller stopped fortifying, they did not insist that they must continue.
Other Problems

• Will the workers reap the benefits?
  – In Indonesia, wages did not go up for people who worked for a wage: may be the employer does not perceive the increase in productivity. Why bother...

• Information:
  – Very difficult to find out on your own: as late at the 70s, scientists thought protein deficiency was the big nutritional problem, not iron or vitamins
  – Do you trust outsiders that give you information?
Consumption is a decision

• Human beings maximize their utility, not their productivity...
• And utility is made of other things than how productive you can be
  – How good the food you have to eat every day tastes (hence, perhaps, the prevalence of sugar in the diet of the poor).
  – Your social status, which may be related to how you spend and other spend: “keeping up with the Jones” (funeral, but also large TV)
  – The diversity of goods you have (cell phones, TV, etc.).
Conclusion: policy Implications

• What does this all mean for policy?
• Policies that puts a lot of emphasis on the *quantity* of food may be misguided, in terms of the benefits they bring: the poverty trap they try to solve is not really there...

• Better ideas:
• Subsidizing double fortified salt purchase, rather than offering free grain (most of which gets lots on the way anyway).
  – Making it as easy as possible to do the right thing: invent foods people like to eat, and which are good for you (e.g. yams rich in beta-caroten).
  – Make school meals rich in nutrition (e.g. sprinkle them with sachets)
  – Other ideas?