

The science behind Total Sanitation Campaign

Open defecation is a national shame; not just from the aesthetic, human dignity and cleanliness angles, but from the health angle as well

Minister Jairam Ramesh is a man with a mission. Stung by the fact that over 626 million Indians do not have access to toilets, he has initiated the *Nirmal Bharat Abhiyan* (NBA) or Total Sanitation Campaign, which would attempt to banish open defecation within a decade.

To ask why and how much it costs would be churlish. Open defecation and open urination are national shames — not just from the aesthetic, human dignity and cleanliness angles, but from the health angle as well.

Where do these refuse end up ultimately? As Sunita Narain of the Centre for Science and Environment points out: "rapidly modernizing India is 'drowning in its own excreta'" (see her commentary in the 14 Jun 2012 issue of *Nature*; <http://www.nature.com/nature/journal/v486/n7402/full/486185a.html>)

And it is this ocean of excreta that our rural (and urban slum) children are being raised in. What are the health consequences of such a sit-

uation? Minister Ramesh is right in quoting Dr. John H. Humphrey of Johns Hopkins University, who has published a "viewpoint" in the 19 September 2009 issue of *The Lancet*.

What does Dr. Humphrey say? He points out that of the 555 million pre-school children in developing countries, 32 per cent have stunted growth and 20 per cent are underweight.

These two conditions together cause the death of one in every five children before they turn 5 years of age. For those alive, the long-term consequences are severe poor performance in school, dropping out, intellectual deficits and therefore lower economic productivity as adults.

Before Humphrey, doctors and public health specialists assumed that such stunting, underweight, and lower cognitive abilities in children are due to lack of enough nutrition or bouts of diarrhoea, or both.

However, data from various studies show that con-



THE HARM: The cause of tropical enteropathy is infection by the bacteria found in faeces. — PHOTO: K.R. DEEPAK

SPEAKING OF SCIENCE

trolling either or both, while helpful, does not always lead the child becoming heavier and taller. Other factors appear involved.

Dr. Humphrey has suggested another culprit, which is the major cause behind stunted growth and underweight in children in their pre-school years.

This is referred to as tropical enteropathy. This is a condition which affects the intestines (hence entero-) by killing or disabling the villi and microvilli covering the surface of the small intestine,

and helping the absorption of the digested food into the blood and lymphatic systems.

It also leads to inflammation and mal-absorption. The benefits of whatever the child eats are not being transferred and utilised in the system for growth and development.

And the cause of tropical enteropathy is infection by the bacteria found in faeces. Children (and adults) living in conditions of poor sanitation are affected in great measure by such faecal bacterial infection leading to enteropathy.

As evidence, Humphrey points out to several studies done mostly in the 1960s in Asia, Africa and Central America, which showed a large number of adults and children living in poor sanitary conditions suffering from tropical enteropathy.

That the environmental sanitation is responsible is also suggested by studies on American soldiers in Vietnam and Peace Corps volunteers in Pakistan, who contracted tropical enteropathy while there, but recovered soon after returning to the U.S. Thus, NBA has a scientific basis behind it.

Actually, the move is such an obvious no-brainer. And many non-governmental organizations have been at it with varying degrees of success.

Sulabh Shauchalaya, (www.sulabhinternational.org) initiated in many cities by Mr. Bindeshwar Pathak, has been a boon to hundreds of thousands of people.

The *Gramalaya* group in Tiruchi has now gone beyond towns and helps Anganwadis in some parts of Tamil Nadu. Another notable effort is that of the renowned nutrition scientist Dr. Mahtab Bamji and the gynaecologist Dr. Devyani Dangoria, both of Hyd-

erabad, have been working with several villages in the Narsapur area in Medak district.

They work with the women there on matters of maternal and child health, nutrition, kitchen gardens for vegetables and greens, education of children and adults, and sanitation.

They have helped the villagers make safe and usable latrines by stacking up 4-foot wide cement rings, and digging pits underneath. A bit of the cost is shared by the owner and the rest by the *Nirmal Gram Abhiyan* programme of CAPART.

They can make over 600 of them within the much talked about Rs. 35 lakhs. Thus NBA has several models to think about and improve upon.

What have been some of the issues in constructing such toilets? Bamji and Sunita list several. Water will of course be the major one; recall hand-washing alone can solve half the problem of infection.

Second, the type of soil is an issue. Use of night soil as manure apparently depends on the type of soil into which the waste goes. There is thus a practical problem here that needs to be addressed as NBA helps build toilets across In-

dia. Third is a matter of what and how the users would like the toilet. It appears that several of them feel "claustrophobic" in an enclosed space. NBA might want to take the help of land/building designers on this issue.

Could they announce a national region-wise competition for designing rural toilets suited to the local conditions of soil, water, population density, micro-environment and other relevant features? As Sunita Narain has said, out-of-the-box thinking is needed here.

Ultimately, it is mindset that needs to change. Habits have to change. If Sikkim can do it (it is the first *Nirmal Rajya* — 100 per cent open defecation-free), the rest of us can do it too!

Let us move from being burdened by the 'dreamy desert sands of dead habit' and move to an India where every child and adult is assured of good sanitation.

The body, mind and well-being of future Indians are at stake without it. The accomplished actress Miss Vidya Balan, whom Minister Ramesh has recruited to help in this noble cause, has her role cut out.

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