

## LETTER TO THE EDITOR

### SHOULD SCHOOL-AGE CHILDREN NOT ATTENDING SCHOOL AND ADULTS AGED 20-44 YEARS BE CONSIDERED HIGH-RISK GROUP FOR BACILLARY DYSENTERY INFECTION IN GUANGZHOU, CHINA? A REVIEW OF 4775 BACILLARY DYSENTERY CASES

January 13, 2014

To the Editor:

Bacillary dysentery (BD), also known as Shigellosis, is the most common intestinal infectious disease caused by *Shigella*, characterized by the passage of loose stools mixed with blood and mucus and accompanied by fever, abdominal cramps and tenesmus. Organisms as low as 10-100 in number can cause the disease<sup>10</sup>. The infection can be transmitted by the fecal-oral route via contaminated water, food, or person-to-person contact<sup>6</sup>.

Worldwide, the incidence of BD is estimated to be 164.7 million cases per year, of which 163.2 million were in developing countries, where 1.1 million deaths occurred<sup>12</sup>. In Guangzhou, the largest trading city in southern China, BD is still one of the most common intestinal infectious diseases. It was reported that during the period of 1997-2005, the annual incidence rate of BD in Guangzhou ranged from 15.24 to 20.50 per 100,000<sup>15</sup>, leading public health authorities to be concerned about its high incidence. To address this issue, in 2006, the Guangzhou municipal government launched an Intestinal Infectious Disease Surveillance, Prevention and Control Program (IIDSPPC). According to IIDSPPC, once a patient was diagnosed with suspected or confirmed BD, a series of preventive measures such as avoiding direct contact with infective patients, disinfection of virally contaminated items or premises, and good personal hygiene practices have been strongly recommended and sometimes mandatorily implemented by local government.

In this study, we obtained data of BD cases in Guangzhou during the period of 2006-2012, from the National Notifiable Disease Report System (NNDRS). In China, BD is a notifiable Class-B communicable disease. This means, as for other national reportable diseases, the BD cases are diagnosed according to the unified diagnostic criteria issued by the Chinese Ministry of Health, for a patient's illness to meet the case definition for BD the clinical signs (diarrhea, fever, abdominal pains, tenesmus, and stool mixed with blood, etc.) must be present and samples should be taken for laboratory confirmation (defined as 1), identification of *Shigella* from stools by culture or 2) and detection of *Shigella* genetic material from stools by PCR. A standard form was used by local physicians and epidemiologists to collect individual information on each BD case, including age, address, date of onset, diagnosis, and laboratory test result, etc. Routine case reporting is done by hospitals through NNDRS within 24 hours after diagnosis. Descriptive statistics are used to describe the basic features of BD confirmed cases in the study, and chi-square test was used to examine linear trends in proportions by years. Analyses were carried out using SAS (V.8.01, SAS Institute, Cary, New Jersey, USA).

From January 1<sup>st</sup>, 2006 to December 31<sup>st</sup>, 2012, a total of 4775 BD confirmed cases were reported in Guangzhou, of which 55.4% (2481) were male patients and 44.6% (1994) were female patients. Annual

incidence rates from 2006 to 2012 were 12.43, 9.96, 6.42, 4.44, 3.21, 2.35, and 1.84 (per 100 000), respectively (Fig. 1). Ages ranged from two months to 101 years old (mean age was 28.6 years). The proportion of confirmed cases between < 5, 6-19, 20-44, 45-64, and > 65 was 36.08% (1723), 7.48% (357), 35.48% (1694), 13.24% (632), and 7.73% (369), respectively. Of particular note, the proportion of patients identified as school-age children (6-15 years) not attending school from 2006 to 2012 was 20.26%, 21.45%, 25.98%, 26.57%, 28.68%, 29.67%, and 32.63%, respectively. There was an increase in linear trend ( $\chi^2_{\text{linear trend}} = 48.71$ ,  $p < 0.001$ ) (Fig. 2).

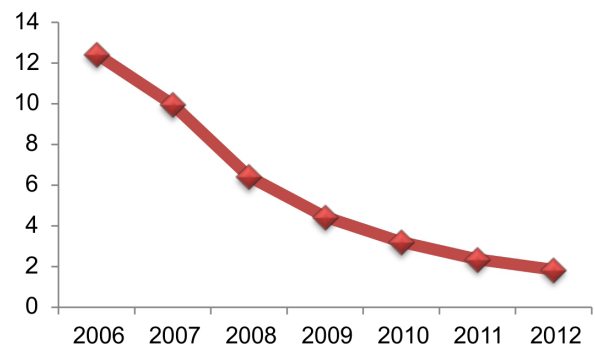


Fig. 1 - Annual occurrence of bacillary dysentery confirmed cases per 100,000 in Guangzhou, southern China, 2006-2012

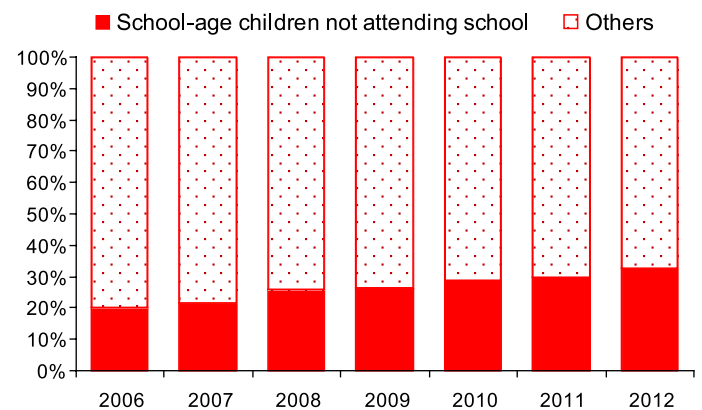


Fig. 2 - Annual proportion of bacillary dysentery confirmed cases identified as young children not attending school in Guangzhou, southern China, 2006-2012.

We found in Guangzhou, that the annual incidence rate of BD showed a decreasing trend in the last six years. This result is consistent with the study from some Chinese cities/provinces, such as Henan<sup>5</sup>, Anhui<sup>13</sup>, and Hangzhou<sup>7</sup> where IIDSPPC was also implemented by the government. However, our results implied that the same or even more attention should

be given to school-age children not attending school, since they have become the noticeable infected occupational group in Guangzhou, a trend that appears to have increased over the years. In China, the majority of this group comes from low-income families, their parents usually do not have enough money to send them to Kindergarten or nursery. They are usually lacking in adequate sanitation, with low health risk awareness, and more likely to have exposure to contaminated food or water. It has been reported that compared to the other group, the school-age children not attending school have higher incidence in many infectious diseases such as hand-food-mouth disease<sup>9</sup>, infectious diarrhea<sup>14</sup>, and hepatitis A<sup>4</sup>. Therefore, more effort should be made to enhance health education and monitoring targeting at school-age children not attending school.

Consistent with the study from Iran<sup>8</sup>, Egypt<sup>1</sup>, and Chinese other cities<sup>11</sup>, we found the highest proportion of BD cases was in the age group  $\leq 5$  years. However, in contrast to earlier findings, current study revealed the second proportion of BD cases was in the age group 20-44 years rather than in age group 6-19 years. One possible explanation for this might be that the vast majority of people aged 6-19 years were school students. Since 2006, as a subprogram of IIDSPCP, preventive strategies have been strengthened in school by increasing or improving the number of hand washing facilities, the frequency of health education course, and the Inspection of food and water hygiene. However, compared to the others, the people aged 20-44 years are more likely to get infected with BD. It is because that people in this age range are in the active stage of social activities; they have more chance to contact with *Shigella* patients or carriers. Furthermore, these people usually have more leisure time, energy, and finance to have a trip, thus more likely to have exposure to Shigellosis. Although we did not collect information on the proportion of BD cases having travel history, numerous previous studies have revealed that travel was associated with increased risk for shigellosis. For example, in the United States, HALEY *et al.* interviewed 929 shigellosis cases from Foodborne Diseases Active Surveillance Network, of which 223 (24%) reported having travelled internationally in the week before symptom onset<sup>3</sup>. In Norway, GUZMAN-HERRADOR *et al.* found 48.28% (1435) of gastrointestinal infections were identified as travel-associated during the period of 2009-2010<sup>2</sup>.

Taken together, we reported that with the implement of IIDSPCP, the BD reported cases in Guangzhou demonstrated a decreasing trend in recent years. However, the proportion of cases identified as school-age children not attending school appeared an increasing trend by years and the proportion of adults aged 20-44 years also became higher than before. This information may be useful to establish strategies for prevention, surveillance, and management in China and in other regions or countries where BD typhus is endemic.

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