Routine screening of healthy population for Salmonella infections as a useful tool for evaluation of the epidemiological surveillance system

Pawel Stefanoff,[1] Anna Cieslik,[2] Michal Czerwinski,[1] Ewa Gonera,[1] Malgorzata Sadkowska-Todys[1]

1) Department of Epidemiology, National Institute of Hygiene, Warsaw, Poland

2) Department of Bacteriology, National Institute of Hygiene, Warsaw, Poland

BACKGROUND

Three main components of the Salmonella surveillance (Figure 1):

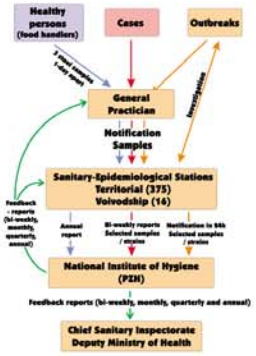
- Laboratory reporting of positive results / strains isolated (from cases, their contacts and screened healthy persons)
- Routine reporting of newly diagnosed cases by medical providers
- Investigation of foodborne outbreaks by public health officers

The goal of the study was to assess the possibility to use the data from routine screening of healthy population for the evaluation of epidemiological surveillance system

MATERIAL AND METHODS

- Cumulative lab data on serotypes of Salmonella strains isolated in Poland in 1961-2003
- Cumulative data on salmonellosis cases reported to routine surveillance
- To evaluate the burden of infection in general population, the percent of persons that screened positive was used to compute the number of persons infected in the age group 15-65 years.
- Longitudinal trends in numbers of infections and cases, were compared.

Figure 1. The Salmonella surveillance system in Poland



RESULTS

In the previous decade a systematic increase of number of cases not laboratory-confirmed was reported to the surveillance system (Figure 2). These cases were epidemiologically linked to confirmed cases in outbreaks.

Since 1990's a decreasing trend of number of healthy persons screened and the rate of positive results is seen (Figure 3). This can indicate a decreasing sensitivity of screening healthy population. However, the proportion of the general population that was screened remained relatively constant during this period (from 1.9% in 1990 to 1.6% in 2003).

The increase of number of screened persons, accompanied by a continuation of decreasing trend in the rate of positive result may suggest that the decrease of rate of Salmonella infections in healthy persons aged 15-65 years is not an artifact.

The estimated number of Salmonella-infected persons in general population aged 15-65 years in 1990-2003 was characterised by a similar, decreasing trend, as the number of registered human cases of salmonellosis (Figure 4).

Figure 2. Comparison of bacteriological and epidmiological surveillance data, Poland, 1961-2003

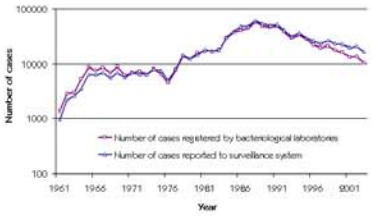


Figure 3. Screening of healthy population. Number of persons tested and rate of Salmonella-positive per 100,000, Poland, 1990-2003

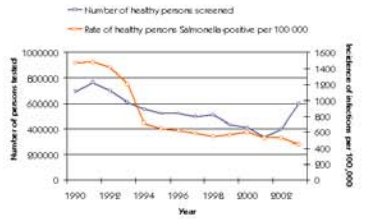


Figure 4. Comparison of estimation of burden of Salmonella infections in general population with number of cases registered, Poland, 1990-2003

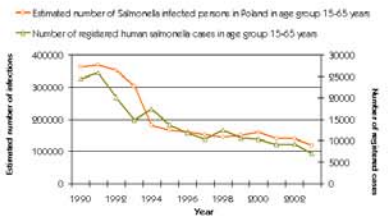
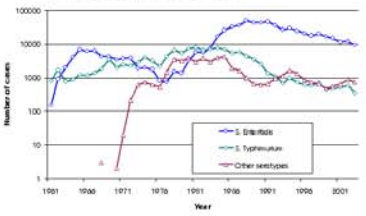


Figure 5. The most prevalent Salmonella serotypes among cases registered, Poland, 1961-2003



In 1961-2003, the most prevalent serotypes were S. Enteritidis and S. Typhimurium (Figure 5). During the last 2 decades, the number of cases of S. Typhimurium decreased.

Figures 6-8 present the role of screening healthy population in detecting newly introduced Salmonella serotypes in Poland.

Figure 6. S. Hadar cases, number of strains isolated from healthy persons and number of cases registered, Poland, 1961-2003

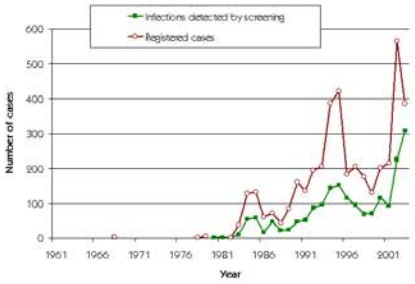


Figure 7. S. Infantis cases, number of strains isolated from healthy persons and number of cases registered, Poland, 1961-2003

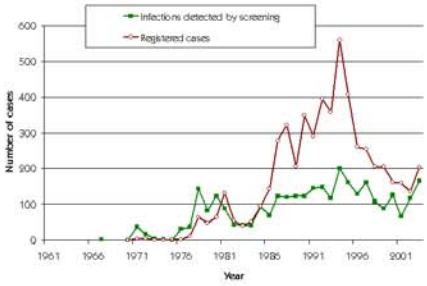
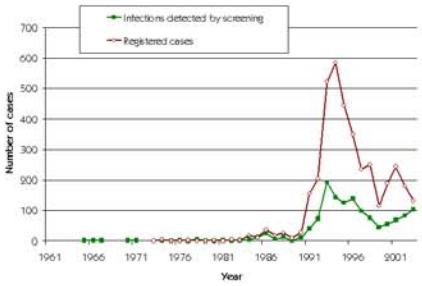


Figure 8. S. Virchow cases, number of strains isolated from healthy persons and number of cases registered, Poland, 1961-2003



CONCLUSIONS

- Screening of healthy population, which is the integral component of the surveillance system in Poland, helps in the evaluation of the system performance
- Screening of healthy population permits early detection of newly introduced serotypes of Salmonella in Poland