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Letter to the Editor

Avian schistosomes impact on public health: a long-term disease observation

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Dear Editor,

Avian Schistosomes is responsible for a dermatitis condition associated with cercaria (also known as swimmer's, clam-digger's or duck itch) which are associated with birds as a normal host any may be associated with mammals other than humans (1). Cercarial dermatitis is primarily caused by waterfowl Schistosome related to *Trichobilharzia spp. (such as T. ocellata, T. brevis, T. stagnicolae, T. physellae, T. regenti, and others) to a greater extent and other types Avian Schistosomes to a lesser extent including Ornithobilharzia spp., Austrobilharzia spp. (A.), Bilharziella polonica, and Gigantobilharzia huronensis* (1). Swimmer's itch or cercarial skin irritation is a brief term hypersensitivity reaction that occurs in people's skin infected with water-borne Schistosomes (2,3).

Federal agencies have provided a long-term record for different epidemiological diseases throughout the country including swimmer's itch disease. The Centers for Disease Control and Prevention (CDC) in the USA is a federal agency from which National Outbreak Reporting System (NORS) has been established as a web-based tool for monitoring of outbreaks (4).

The outbreak illness conditions could be isolated and processed from the dataset record using statistical software, primarily Minitab v17 program for Windows (Minitab, Inc minitab.com, USA). Pareto analysis of the settings involved showed that 80 % of sickness cases occurred in beaches and private residence places during monitoring of the recorded events. Water types responsible for the transfer of the etiological agent are mainly from lakes, reservoirs and/or impoundments which may account to about 94 % of the illness cases and the remaining recorded cases originated from the ponds.

Figure 1 shows the chronological distribution of illness cases of the clam-digger's itch outbreaks. Pareto diagrams demonstrate the peaks of the sickness cases for the outbreaks in terms of the month and year with nearly 55% occurrence in July and 80% in 2011, 2012 and 2016. Rectangular level (contour) diagram illustrates the magnitude of illnesses in relation to the outbreaks time of incidences with maximum heights in July 2016 followed by May 2011.

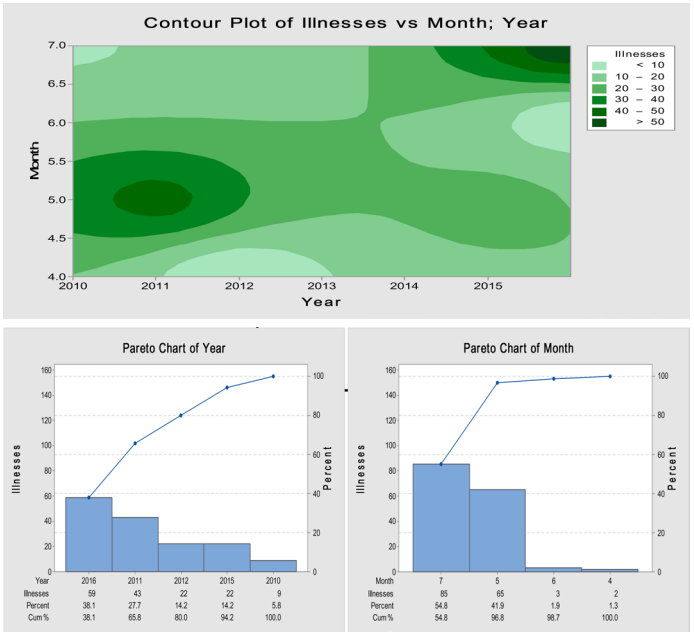

Figure 1. Time-distribution of illness cases for Avian Schistosomes

Shewhart charts are indispensable tools for monitoring and assessment of the observed events or characteristics. These charts have different measurable parameters viz. Control Limit (CL), Lower Control Limit (LCL) and Upper Control Limit (UCL). So, they were used to inspect the Avian Schistosomes outbreaks pattern. Control charts in Figure 2 visualize the pattern of the outbreaks despite the very limited probability of occurrences 0.003. Rare event control

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chart demonstrates infrequent rate for the occurrence of swimmer's itch outbreak disease with the average and maximum interval between two successive events was estimated to be 253 and 2417 days, respectively. On the other hand, Laney-modified attribute chart shows the trend of the number of illnesses per outbreak. The mean and the upper threshold are 19 and 83 affected individuals per the outbreak, respectively.

Duck itch outbreak illnesses were primarily spotted in New York, Idaho, California, Illinois and Ohio at 74.2%, 14.2%, 7.1%, 2.6% and 1.9%, respectively as could be seen in Figure 3.

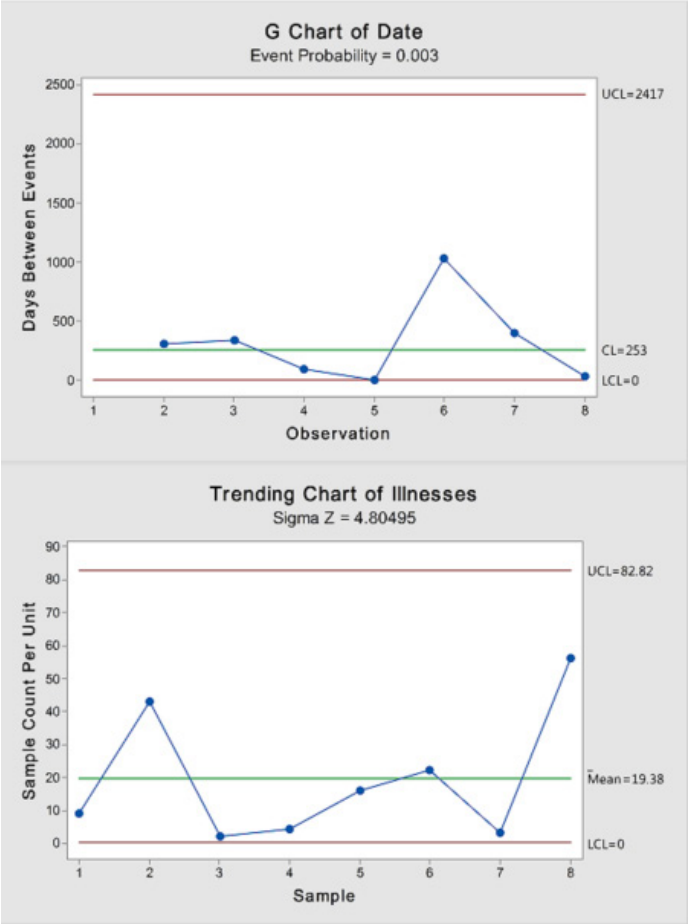

Figure 2. Process-behavior charts showing avian Schistosomes outbreaks trend in terms of the number of cases and frequency during monitoring period

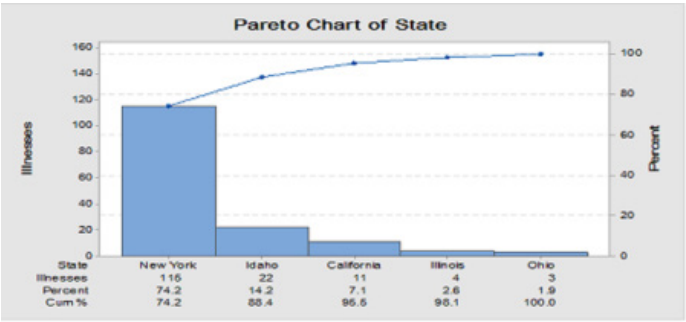

Figure 3. States that showed avian Schistosomes outbreak cases arranged in descending order based on the number of illness cases reported

Avian Schistosomes outbreaks exerts very limited effects on the public health with very low risk, if the illnesses from this disease were compared with other types of the outbreaks recorded by NORS during the same period with the exception of the shellfish poisoning (almost the same risk value 54 for Avian Schistosomes vs. 53 shellfish poisoning) using the same quantitative hazard analysis techniques which have been devised earlier in other works on the same line (5-7). Humans may be infected with zoological or craniates Schistosomes however this leads to no or very little morbidity (8). Despite this fact, other researchers have considered it as an emerging disease which is present worldwide and has been observed in many regions which have not any previous history or rare events of dermatitis (9). Thus, dissemination and abundance of this disease should be watched thoroughly and appropriate trending must be executed to assess the current and the future impact of the avian cercarial outbreaks globally. The dynamic patterns and distributions of duck itch outbreaks around the world are greatly influenced by the regular and seasonal migratory behavior of the birds (10). By the time, these migrations on turn might be distorted or modified by other factors such as global warming, pollutions and the earth's magnetic field.

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