

A Brief Introduction to PulseNet Taiwan

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Centers for Disease Control, under Department of Health, the Executive Yuan (Taiwan CDC) has officially announced on 3rd of October 2006 the launch of a national network of public health laboratories named PulseNet Taiwan. This surveillance network was used to perform standardized molecular subtyping (or “fingerprinting”) by pulsed-field gel electrophoresis (PFGE) for the purposes of detecting and identifying bacteria causing food borne diseases. The technical platform of such standardized procedures was inherited from USA CDC as the latter established the very first PulseNet in 1996. PulseNet has achieved great results when used in the surveillance of a large outbreak of food borne illness in 1993 caused by the bacterium *Escherichia coli* O157:H7 in the western United States. PulseNet technical platform includes standardized PFGE genetic subtyping techniques, the use of computer software BioNumerics for analyzing/ comparing DNA fingerprints or PFGE patterns obtained from different specimens, setting up a PFGE pattern database, and an internet system for data exchange. How PulseNet works is by starting with PFGE patterns of unknown isolates being made by participant laboratories with standardized equipment and methods, followed by comparing them with strain patterns previously filed in the database,

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exchanging information between health agencies accordingly to find out isolates of the same sources and then identifying suspected clustering infection cases, providing directions to epidemiological inspection, tracing back to the infection source, and eventually letting relevant health authorities take over to carry out the required effective control and preventive measures. The task and responsibility were shared by a group of institutes including public health institutions, agricultural and food management administrations. Before the launch of PulseNet Taiwan, PulseNet has already been used in many countries and places around the world and is now aiming to reach for a global surveillance network. The benefits of PulseNet Taiwan include surveillance of food borne communicable diseases caused by bacterial agents, establishment of a national DNA fingerprint pattern database of major bacterial communicable disease pathogens, acting as one of many international PulseNet surveillance network exchange platforms, and being incorporated into the defense chain system against bio-terrorist attacks. This article provides a concise introduction to the developing history of PulseNet surveillance network, current situation of the international PulseNet in general, and also the present status and future developing direction of PulseNet Taiwan as references for those colleagues and parties who are interested in the field of disease control and prevention.