

### Review of Simplifying Border Quarantine Practice in Taiwan

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#### Abstract

Since the late 19<sup>th</sup> century, Taiwan has been implementing systematic border quarantine procedures. There are many quarantine measures applied to the entry of conveyances, persons and goods at international ports. However, the border quarantine system faced many challenges and pressures due to the changes of the internal and external environmental factors. Therefore, Taiwan Centers for Disease Control (CDC) introduced a series of simplifications for border quarantine since 2014. To understand the effectiveness of the policies, we surveyed the reduction of man-hours of all regional centers after simplifying border quarantine measures, and used “Infectious Disease Data Warehouse” and “CDC Business Objects” to collect relevant data. The results showed that all regional centers reduced a total of 349.1 man-hours per month and in which Taipei, Northern and Kaohsiung-Pingtung Regional Centers accounted for 90%. In addition, after the application of restrictive blood collection, the rate of confirmed imported dengue cases detected in international ports was similar to previous years. Therefore, restrictive blood collection performed a good level of effectiveness with the simplified policy.

Taiwan CDC will continue to assess, plan and adjust border quarantine measures and strengths with a vision to minimize the burdens of frontline quarantine personnel, as well as maintain a flexible response to ensure the maximum protection for the health.

**Keywords:** Border quarantine, Policy simplification, Imported

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## Establishment of Quality Control Method for Identifying *Probothrops mucrosquamatus* and *Viridovipera stejnegeri* from Taiwan

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### Abstract

Incidence of snakebite envenomings remain high in the world. Nowadays it is an important and particular public health issue in the tropical and subtropical countries, and antivenom is the most effective treatment for snake bites at present. Venom is raw material for manufacturing antisera. Because of the stringent progress of the global pharmaceutical regulations and regulatory requirements, it is necessary to establish a set of more advanced quality control methods for identifying venom at its species. The goal in this research is to analyze venoms by high performance liquid chromatography (HPLC) and double immunodiffusion, and to determine the specific peaks for distinguishing the species in the chromatogram. A long-term analysis of wild snake venom would be beneficial to visualize if the changes in venom protein composition due to intraspecies variation of the geographical distribution or exotic species.

**Keywords:** Snakebite envenoming, Venom, Antivenom, High performance liquid chromatography (HPLC), HPLC chromatogram library

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Numbers of New Cases and Cumulative Cases of Notifiable Infectious Diseases (by week of diagnosis)

| Case diagnosis week |   | Week 48 |      | Week 1–49 |       |
|---------------------|---|---------|------|-----------|-------|
| Classification      | Disease Diagnosed <sup>1</sup>                    | 2016    | 2015 | 2016      | 2015  |
| Category I          | Plague  | 0       | 0    | 0         | 0     |
|                     | Rabies  | 0       | 0    | 0         | 0     |
|                     | SARS  | 0       | 0    | 0         | 0     |
|                     | Smallpox  | 0       | 0    | 0         | 0     |
| Category II         | Acute Flaccid Paralysis                           | 1       | 0    | 37        | 19    |
|                     | Acute Viral Hepatitis type A                      | 16      | 6    | 1046      | 141   |
|                     | Amoebiasis  | 8       | 5    | 294       | 331   |
|                     | Anthrax   | 0       | 0    | 0         | 0     |
|                     | Chikungunya Fever                                 | 1       | 0    | 10        | 4     |
|                     | Cholera   | 0       | 0    | 9         | 10    |
|                     | Dengue Fever                                      | 6       | 1783 | 781       | 41027 |
|                     | Diphtheria  | 0       | 0    | 0         | 0     |
|                     | Enterohemorrhagic E. coli Infection               | 0       | 0    | 0         | 0     |
|                     | Epidemic Typhus Fever                             | 0       | 0    | 0         | 0     |
|                     | Hantavirus Pulmonary Syndrome                     | 0       | 0    | 0         | 0     |
|                     | Hemorrhagic Fever with Renal Syndrome             | 0       | 0    | 3         | 2     |
|                     | Malaria   | 0       | 0    | 14        | 9     |
|                     | Measles   | 0       | 0    | 13        | 29    |
|                     | Meningococcal Meningitis                          | 1       | 0    | 8         | 3     |
|                     | Paratyphoid Fever                                 | 0       | 0    | 5         | 6     |
|                     | Poliomyelitis                                     | 0       | 0    | 0         | 0     |
|                     | Rubella   | 0       | 0    | 4         | 6     |
| Shigellosis         | 4   | 3       | 206  | 171       |       |
| Typhoid fever       | 1   | 0       | 8    | 27        |       |
| West Nile Fever     | 0   | 0       | 0    | 0         |       |
| Category III        | Acute Viral Hepatitis type B                      | 2       | 1    | 102       | 111   |
|                     | Acute Viral Hepatitis type C <sup>5</sup>         | 5       | 8    | 185       | 204   |
|                     | Acute Viral Hepatitis type D                      | 0       | 0    | 1         | 2     |
|                     | Acute Viral Hepatitis type E                      | 0       | 1    | 15        | 5     |
|                     | Acute Viral Hepatitis untype                      | 0       | 0    | 0         | 2     |
|                     | Congenital Rubella Syndrome                       | 0       | 0    | 0         | 0     |
|                     | Enteroviruses Infection with Severe Complications | 0       | 0    | 30        | 5     |
|                     | Haemophilus Influenza type b Infection            | 0       | 0    | 14        | 2     |
|                     | Japanese Encephalitis                             | 0       | 0    | 23        | 30    |
|                     | Legionellosis                                     | 2       | 1    | 107       | 157   |
|                     | Mumps <sup>2</sup>                                | 8       | 9    | 571       | 722   |
|                     | Neonatal Tetanus                                  | 0       | 0    | 0         | 0     |
|                     | Pertussis   | 0       | 2    | 18        | 87    |
|                     | Tetanus <sup>2</sup>                              | 1       | 0    | 11        | 10    |
| Category IV         | Botulism  | 0       | 0    | 5         | 2     |
|                     | Brucellosis                                       | 0       | 0    | 0         | 2     |
|                     | Complicated Influenza                             | 22      | 3    | 2022      | 823   |
|                     | Complicated Varicella <sup>4</sup>                | 5       | 0    | 42        | 47    |
|                     | Endemic Typhus Fever                              | 0       | 0    | 14        | 32    |
|                     | Herpesvirus B Infection                           | 0       | 0    | 0         | 0     |
|                     | Invasive Pneumococcal Disease                     | 9       | 8    | 538       | 473   |
|                     | Leptospirosis                                     | 2       | 1    | 117       | 81    |
|                     | Lyme Disease                                      | 0       | 0    | 2         | 2     |
|                     | Melioidosis                                       | 1       | 0    | 46        | 37    |
|                     | Q Fever   | 0       | 1    | 43        | 44    |
|                     | Scrub Typhus                                      | 10      | 19   | 462       | 469   |
|                     | Toxoplasmosis                                     | 0       | 0    | 10        | 11    |
| Tularremia          | 0   | 0       | 0    | 0         |       |
| Category V          | Ebola Virus Disease                               | 0       | 0    | 0         | 0     |
|                     | Ebola-Marburg Hemorrhagic Fever                   | 0       | 0    | 0         | 0     |
|                     | Novel Influenza A Virus Infections <sup>6</sup>   | 0       | 0    | 0         | 0     |
|                     | Lassa Fever                                       | 0       | 0    | 0         | 0     |
|                     | Rift Valley Fever                                 | 0       | 0    | 0         | 0     |
|                     | Middle East Respiratory Syndrome Coronavirus      | 0       | 0    | 0         | 0     |
| Yellow Fever        | 0   | 0       | 0    | 0         |       |

- The following 8 chronic diseases are excluded from the table: MDR-TB, Tuberculosis, Syphilis, Gonorrhoea, HIV Infection, AIDS, Hansen Disease and Creutzfeldt-Jakob Disease.
- Reported cases.
- Since 2014/1/1, "Varicella" was modified to "Complicated Varicella".
- Since 2014/3/6, the case definition for confirmed Acute hepatitis C was changed from "meet the clinical and laboratory conditions" to "meet the clinical or laboratory conditions".
- Since 2014/7/1, various subtypes of human cases of avian influenza are reported as "novel influenza A virus infections", a Category V Notifiable Infectious Disease. The original "H5N1 flu" and "H7N9 flu", which were respectively listed as a Category I Notifiable Infectious Disease and a Category V Notifiable Infectious Disease were removed from the list on the same day.
- Since 2016/1/22, "Zika Virus Infection" was listed as a Notifiable Infectious Disease.

## Suspected Clusters

- Twenty-one clusters were reported, including 8 diarrhea clusters, 5 varicella clusters, 3 tuberculosis clusters, 3 influenza-like illness clusters, 1 upper respiratory tract infection cluster, and 1 fever of unknown origin cluster.

## Imported Infectious Diseases

- 13 confirmed cases were imported from 5 countries during Week 48 of 2016.

| Country<br>Disease   | Indonesia | Vietnam | Philippines | China | Thailand | Total |
|----------------------|-----------|---------|-------------|-------|----------|-------|
| Dengue Fever         | 1         | 2       | 2           |       | 1        | 6     |
| Shigellosis          | 3         |         |             | 1     |          | 4     |
| Amoebiasis           | 2         |         |             |       |          | 2     |
| Chikungunya<br>Fever | 1         |         |             |       |          | 1     |
| <b>Total</b>         | 7         | 2       | 2           | 1     | 1        | 13    |

Note: The statistics listed in this table include imported cases that were either confirmed or updated\* in the previous week.

- A total of 744 confirmed cases were imported from 37 countries in 2016.
- Top 3 imported diseases : Dengue fever (339), Amoebiasis (149), Shigellosis (96).
- Top 3 countries responsible for most imported cases : Indonesia (313), Philippines (91), Thailand (67).

## Summary of Epidemic

- **Influenza** : Since the northeast monsoon has become prevalent, the recent temperature has dropped. As a result, influenza activity is expected to gradually increase. H3N2 is currently the dominant strain circulating in the community.
- **Enterovirus** : The epidemic has increased continuously in the community. The numbers of visits to outpatient services and ER for enterovirus infection during Week 48 is higher than that during Week 47, and enterovirus activity is above the epidemic threshold. The numbers of severe cases reported and confirmed were under the epidemic threshold. Coxsackie A virus is currently the dominant strain circulating in the community. Sporadic cases of enterovirus 71 infection have been recently confirmed. Thus far this year, a total of 165 cases of enterovirus 71 infection, including 23 severe cases and 141 mild cases, and 1 suspected severe cases, have been confirmed.

- **Dengue Fever** : Imported cases have continued to be reported. The recent temperature in southern Taiwan has contributed to the continuing mosquito activity.
- **Zika Virus Infection** : The first case of Zika virus infection has been confirmed in Texas, United States. The epidemic has continuously increased in Southeast Asian countries, elevating the risk of importing Zika virus into Taiwan from these countries.

### Numbers of New Cases and Cumulative Cases of Notifiable Infectious Diseases (by week of diagnosis)

| Case diagnosis week                |   | Week 49  |      | Week 1—49 |       |
|------------------------------------|---|----------|------|-----------|-------|
| Classification                     | Disease Diagnosed <sup>1</sup>                    | 2016     | 2015 | 2016      | 2015  |
| <b>Category I</b>                  | Plague  | 0        | 0    | 0         | 0     |
|                                    | Rabies  | 0        | 0    | 0         | 0     |
|                                    | SARS  | 0        | 0    | 0         | 0     |
|                                    | Smallpox  | 0        | 0    | 0         | 0     |
| <b>Category II</b>                 | Acute Flaccid Paralysis                           | 0        | 0    | 37        | 19    |
|                                    | Acute Viral Hepatitis type A                      | 32       | 4    | 1078      | 145   |
|                                    | Amoebiasis  | 4        | 9    | 298       | 340   |
|                                    | Anthrax   | 0        | 0    | 0         | 0     |
|                                    | Chikungunya Fever                                 | 0        | 0    | 10        | 4     |
|                                    | Cholera   | 0        | 0    | 9         | 10    |
|                                    | Dengue Fever                                      | 7        | 1157 | 788       | 42184 |
|                                    | Diphtheria  | 0        | 0    | 0         | 0     |
|                                    | Enterohemorrhagic E. coli Infection               | 0        | 0    | 0         | 0     |
|                                    | Epidemic Typhus Fever                             | 0        | 0    | 0         | 0     |
|                                    | Hantavirus Pulmonary Syndrome                     | 0        | 0    | 0         | 0     |
|                                    | Hemorrhagic Fever with Renal Syndrome             | 0        | 0    | 3         | 2     |
|                                    | Malaria   | 0        | 0    | 14        | 9     |
|                                    | Measles   | 0        | 0    | 13        | 29    |
|                                    | Meningococcal Meningitis                          | 0        | 0    | 8         | 3     |
|                                    | Paratyphoid Fever                                 | 0        | 0    | 5         | 6     |
|                                    | Poliomyelitis                                     | 0        | 0    | 0         | 0     |
|                                    | Rubella   | 0        | 0    | 4         | 6     |
|                                    | Shigellosis                                       | 2        | 4    | 208       | 175   |
|                                    | Typhoid fever                                     | 1        | 0    | 9         | 27    |
| West Nile Fever                    | 0   | 0        | 0    | 0         |       |
| <b>Category III</b>                | Acute Viral Hepatitis type B                      | 4        | 1    | 106       | 112   |
|                                    | Acute Viral Hepatitis type C <sup>5</sup>         | 4        | 4    | 189       | 208   |
|                                    | Acute Viral Hepatitis type D                      | 0        | 0    | 1         | 2     |
|                                    | Acute Viral Hepatitis type E                      | 1        | 1    | 16        | 6     |
|                                    | Acute Viral Hepatitis untype                      | 0        | 0    | 0         | 2     |
|                                    | Congenital Rubella Syndrome                       | 0        | 0    | 0         | 0     |
|                                    | Enteroviruses Infection with Severe Complications | 0        | 0    | 30        | 5     |
|                                    | Haemophilus Influenza type b Infection            | 0        | 0    | 14        | 2     |
|                                    | Japanese Encephalitis                             | 0        | 0    | 23        | 30    |
|                                    | Legionellosis                                     | 6        | 3    | 113       | 160   |
|                                    | Mumps <sup>2</sup>                                | 6        | 14   | 577       | 736   |
|                                    | Neonatal Tetanus                                  | 0        | 0    | 0         | 0     |
|                                    | Pertussis   | 0        | 0    | 18        | 87    |
|                                    | Tetanus <sup>2</sup>                              | 2        | 1    | 13        | 11    |
|                                    | <b>Category IV</b>                                | Botulism | 0    | 0         | 5     |
| Brucellosis                        |   | 0        | 0    | 0         | 2     |
| Complicated Influenza              |   | 23       | 4    | 2045      | 827   |
| Complicated Varicella <sup>4</sup> |   | 0        | 0    | 42        | 47    |
| Endemic Typhus Fever               |   | 0        | 1    | 14        | 33    |
| Herpesvirus B Infection            |   | 0        | 0    | 0         | 0     |
| Invasive Pneumococcal Disease      |   | 10       | 15   | 548       | 488   |
| Leptospirosis                      |   | 0        | 3    | 117       | 84    |
| Lyme Disease                       |   | 0        | 0    | 2         | 2     |
| Melioidosis                        |   | 3        | 0    | 49        | 37    |
| Q Fever                            |   | 0        | 0    | 43        | 44    |
| Scrub Typhus                       |   | 20       | 23   | 482       | 492   |
| Toxoplasmosis                      |   | 0        | 2    | 10        | 13    |
| Tularremia                         |   | 0        | 0    | 0         | 0     |
| <b>Category V</b>                  | Ebola Virus Disease                               | 0        | 0    | 0         | 0     |
|                                    | Ebola-Marburg Hemorrhagic Fever                   | 0        | 0    | 0         | 0     |
|                                    | Novel Influenza A Virus Infections <sup>6</sup>   | 0        | 0    | 0         | 0     |
|                                    | Lassa Fever                                       | 0        | 0    | 0         | 0     |
|                                    | Rift Valley Fever                                 | 0        | 0    | 0         | 0     |
|                                    | Middle East Respiratory Syndrome Coronavirus      | 0        | 0    | 0         | 0     |
| Yellow Fever                       | 0   | 0        | 0    | 0         |       |

1. The following 8 chronic diseases are excluded from the table: MDR-TB, Tuberculosis, Syphilis, Gonorrhoea, HIV Infection, AIDS, Hansen Disease and Creutzfeldt-Jakob Disease.
2. Reported cases.
3. Since 2014/1/1, "Varicella" was modified to "Complicated Varicella".
4. Since 2014/3/6, the case definition for confirmed Acute hepatitis C was changed from "meet the clinical and laboratory conditions" to "meet the clinical or laboratory conditions".
5. Since 2014/7/1, various subtypes of human cases of avian influenza are reported as "novel influenza A virus infections", a Category V Notifiable Infectious Disease. The original "H5N1 flu" and "H7N9 flu", which were respectively listed as a Category I Notifiable Infectious Disease and a Category V Notifiable Infectious Disease were removed from the list on the same day.
6. Since 2016/1/22, "Zika Virus Infection" was listed as a Notifiable Infectious Disease.

## Suspected Clusters

- Nineteen clusters were reported, including 9 diarrhea clusters, 3 influenza-like illness clusters, 3 upper respiratory tract infection clusters, 2 varicella clusters, and 2 tuberculosis clusters.

## Imported Infectious Diseases

- 17 confirmed cases were imported from 8 countries during Week 49 of 2016.

| Country<br>Disease | Indonesia | Vietnam  | China    | Philippines | Palau    | Japan    | India    | Myanmar  | Total     |
|--------------------|-----------|----------|----------|-------------|----------|----------|----------|----------|-----------|
| Dengue Fever       | 1         | 2        |          | 1           | 1        |          |          | 1        | 6         |
| Amoebiasis         | 2         |          | 1        |             |          |          | 1        |          | 4         |
| Shigellosis        | 1         |          |          | 1           |          |          |          |          | 2         |
| Typhoid fever      | 1         |          |          |             |          |          |          |          | 1         |
| IPD                |           |          | 1        |             |          |          |          |          | 1         |
| Hepatitis C        |           | 1        |          |             |          |          |          |          | 1         |
| Hepatitis A        |           |          |          |             |          | 1        |          |          | 1         |
| Hepatitis B        |           |          | 1        |             |          |          |          |          | 1         |
| <b>Total</b>       | <b>5</b>  | <b>3</b> | <b>3</b> | <b>2</b>    | <b>1</b> | <b>1</b> | <b>1</b> | <b>1</b> | <b>17</b> |

Note: The statistics listed in this table include imported cases that were either confirmed or updated\* in the previous week.

- A total of 761 confirmed cases were imported from 38 countries in 2016..
- Top 3 imported diseases : Dengue fever (345), Amoebiasis (153), Shigellosis (98).
- Top 3 countries responsible for most imported cases : Indonesia (318), Philippines (93), Thailand (67).

## Summary of Epidemic

- **Influenza** : A strong continental cold air mass that is expected to arrive in Taiwan this week will lower the temperature in all parts of Taiwan significantly. As a result, influenza activity is likely to increase. H3N2 is currently the dominant strain circulating in the community.
- **Enterovirus** : The epidemic has increased continuously in the community. Coxsackie A virus is currently the dominant strain circulating in the community. Sporadic cases of enterovirus 71 infection have been recently confirmed. Thus far this year, a total of 167 cases of enterovirus 71 infection, including 23 severe cases and 143 mild cases, and 1 suspected severe cases, have been confirmed.

- **Dengue Fever** : Imported cases have continued to be reported. The recent temperature in southern Taiwan has contributed to the continuing mosquito activity.
- **Zika Virus Infection** : New cases of Zika virus infection have been confirmed in Texas, United States. The epidemic has continuously increased in Southeast Asian countries, elevating the risk of importing Zika virus into Taiwan from these countries.

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