Dengue is the most common mosquito-borne viral diseases, and currently presents serious threats to many parts of the world. A history of dengue can be traced back to the Chin Dynasty (265 - 420 AD), which was referred to as a "water poison" associated with flying insects. In the early history of dengue is unclear because of the similarity of its clinical picture to other febrile illnesses. Dengue was recognised as a specific disease entity in human beings in the late 18th century. The viral aetiology and the transmission by mosquitoes were finally determined in the 20th century. The disease spread out to Africa in the 15th to 19th centuries due increased trade activities. Early reports of dengue epidemics are from 1779 and 1780, when an epidemic spread across Asia, Africa and North America. Then, until 1940, epidemics were infrequent. Epidemic of dengue during and after Second World War (WWII) has been attributed to ecologic disruption, troop’s movement and travel. These led to the spread of different serotypes of the disease to new areas, and the emergence of more severe dengue haemorrhagic fever (DHF). After WWII, transportation and rapid urbanization led to increased transmission of dengue and hyper endemicity (multiple serotypes present) in most countries especially in South East Asian countries, with subsequent emergence of the severe forms of dengue.

Dengue is cause by dengue fever virus (DENV), a RNA virus from the family of Flaviviridae and genus of Flavivirus. They are transmitted by arthropods (mosquitoes or ticks), and are therefore also referred to as arboviruses (arthropod-borne viruses). The role of human being is serving as the viral human-host in dengue fever virus transmission. There are five distinct dengue virus serotypes; the first four are DENV-1, DENV-2, DENV-3 and DENV-4. The presents of fifth serotype was announced in 2013. Presents of fifth serotype dengue fever virus is posing serious challenges to current development of vaccine for dengue fever virus. The infection with one elicits lifelong immunity to that serotype, but offers only transient protection against the other serotypes. Each of the serotypes is responsible for dengue epidemic, and reinfection with different serotypes is associated with more severe dengue.
Generally the principal symptoms of dengue fever are include, high fever and at least two of the followings: severe headache, severe eye pain (behind eyes), joint pain, muscle and/or bone pain, rash, mild bleeding manifestation (e.g., nose or gum bleed, petechial, or easy bruising) and low white cell count. Younger children and those with their first dengue infection have a milder illness than older children and adults. Normally the temperature declines 3 to 7 days after symptoms began, during this period very important to look for any of the following warning signs of severe dengue or dengue haemorrhagic fever, the warning signs are: severe abdominal pain or persistent vomiting; red spots or patches on the skin; bleeding from nose or gums; vomiting blood; black, tarry stools (faeces, excrement); drowsiness or irritability; pale, cold, or clammy skin; and difficulty in breathing.

Dengue haemorrhagic fever (DHF) is characterized by a fever that lasts from 2 to 7 days, with general signs and symptoms consistent with dengue fever. As the fever declines, warning signs may develop. This marks the beginning of a 24 to 48 hour period when the smallest blood vessels (capillaries) become excessively permeable, allowing the fluid component to escape from the blood vessels into cavity such as the peritoneum and pleural cavity (leading to pleural effusions). This may lead to failure of the circulatory system and shock, and without prompt and appropriate treatment may lead to death. In addition, the patient with DHF has a low platelet count and haemorrhagic manifestations, tendency to bruise easily or have other types of skin haemorrhages, bleeding nose or gums, and also internal bleeding.

Dengue fever is usually a self-limited illness. There is no specific antiviral treatment currently available for dengue fever. Supportive care with analgesics such as acetaminophen, fluid replacement (drinks plenty of fluids to prevent dehydration), bed rest and prevent mosquito bites is usually sufficient for dengue fever. Analgesics such as aspirin, nonsteroidal anti-inflammatory drugs (NSAIDs – ibuprofen, naproxen etc.), and corticosteroids should be avoided. Management of severe dengue of DHF requires careful attention to fluid management and proactive treatment of haemorrhage. Adequately management of DHF generally requires hospitalization. Prompt case detection (early diagnosis) and appropriate clinical management can avoid mortality resulting from dengue fever and DHF.

Dengue virus is transmitted from person to person through the bite of infected Aedes mosquitoes. The origin of the primary mosquito vector, Aedes aegypti, is either from Africa or Asia, but it was widespread throughout urban tropical and subtropical coastal cities of the world due to the use of shipping vessels with trade expansion. These shipping vessels allowed transportation of breeding sites for the vector along with humans to complete the transmission cycle, allowing for slow but evident introduction of the virus and the mosquito to coastal areas around the world. In fact, there have been four major factors of this increase in incidence and geographic expansion of dengue vectors, they are: 1) population growth in tropical and sub-tropical countries, 2) urban growth in those countries, 3) lack of effective mosquito control in tropical and subtropical countries of urban area, and 4) globalisation and travelling. Mobility of population is allowing transportation of previously known predominance urban dengue virus vector Aedes aegypti to the rural area. The other species of Aedes mosquito, Aedes albopictus feeds on multiple species of vertebrates also responsible for dengue transmission especially in rural areas. Aedes mosquitoes breed in and around houses in regular water containers or disposed water-holding vessels. Both of the species of Aedes mosquitoes are highly adaptable to human habitation, resulting with the spread of the dengue fever vectors have been difficult to contain.
The prevention and control of dengue emphasis widely on vector control methods. These include environmental, biological, and chemical vector control management strategies and methodologies. Evidences had showed that success and failure of such strategies and methodologies. The first success in controlling an *Aedes aegypti* transmitted disease was the control of yellow fever in Cuba in 1904, and followed by controlling the same disease in Panama in 1912. More successes were reported in Brazil (1930s) and in the American region after World War II, when *Aedes aegypti* was eliminated from 23 countries in Central and South America between 1946 and 1970, during that period epidemics of yellow fever and dengue effectively prevented. After this period, there were 30 year period of complacency and apathy on prevention of infectious diseases especially vector control programme. In early 1970s there has been change in public health policy in which new technology could be used to more effectively control mosquitoes and prevent diseases without investment in the infrastructure and the hard work associated with successful campaigns in the past. The concept of space spraying of insecticides using the new ultra low volume technology was initiated in the early 1970s as the recommended method in dengue prevention and control programme. This strategy has been a failure in dengue control and prevention programme, resulting from 1970, the tropical and sub-tropical countries has become hyper endemic for dengue as both the viruses and the mosquito vectors have been spread. Nevertheless, in the past 40 years at least two countries have been reporting success in preventing epidemic dengue by controlling *Aedes aegypti*, first in Singapore from 1973 to 1989, and second in Cuba from 1982 to 1997. Both are island countries and vertically structured programmes were used with a strong emphasis on larval control for dengue control. Singapore’s strategy for the prevention and control of DF was based on a strong surveillance capability, an extensive public education program, and a strict enforcement regime. It is known that in dengue control and prevention, while public health education served to raise awareness, it did not spur action, surveys have shown that while the knowledge content was extremely high, attitudes were very poor and enforcement did not change people’s attitude.

Several lessons were learnt from previous experience of dengue control and prevention programmes. There are many, but the most important lesson is that space spraying, as commonly conducted in most countries, does not have any impact or only very minimum on dengue transmission. We must acknowledge that what most countries have been doing to control *Aedes* mosquitoes has not worked to control *Aedes* mosquitoes. Second, the role of government in coordinating efforts cannot be underestimated. Without a coordinated “topdown” and “bottom-up” approach, successful implementation of control and prevention programmes of dengue is unlikely to be achieved and sustained. Government agencies must still be held responsible for mounting control efforts, especially to avoid an outbreak. The government, must openly displayed full commitment to join in the battle with the community, by strengthened its surveillance system and started a research facility to study dengue. Thirdly, the community-based programmes are the key to successful control and prevention programmes recognizing the fundamental importance of mobilizing and channeling household-level behaviors and capacities in eliminating mosquito breeding sites, reducing exposure, and targeting efforts. Strategy, with emphaeses to winning the community over and getting them to take responsibility for the dengue problem able to raise the level of ownership of the dengue control and prevention programme among community members, who volunteered their time and participate in the programme. Community involvement and ownership are necessary for long-term sustainability, but it takes years to achieve efficacy, as demonstrated by the seatbelt and antismoking campaigns. The fourth lesson is about local leadership at the local level to guides the successful establishment and follow-through of intervention programmes. Local leaders have necessary insider knowledge of neighbourhood practices, and, as such, may be better able to organize activity to control mosquito breeding.
sites using environmental management by enlisting community participation. Lastly, the final lesson learned is that no single approach to *Aedes* mosquitoes control will provide success when used in isolation.

Some progress has been made in development of new technologies for control of *Aedes* mosquitoes and prevention of dengue infections. Efforts are being made to develop new insecticides that will provide residual activity which can be alternated in their use to prevent resistance from developing in the mosquito. Progress has been made in the biologically-based insecticides to control of *Aedes aegypti*; Copepods have been used to eliminate and/or control *Aedes aegypti* in parts of Vietnam; the most widely used microbial insecticide such is *Bacillus thuringiensis var. israelensis* (Bti) and *Wolbachia* had showed promising result for larval control; finally, the use of genetically modified mosquitoes also appears very promising, this technologies, which has negligible or no risk to humans or the environment, is currently undergoing trials in several countries.

While no vaccine is currently available, but there has also been good progress in developing a dengue vaccine. At least six dengue vaccine candidates are in various stages of clinical development, and many others are in preclinical stages. Dengue Vaccine Initiative, a consortium of the International Vaccine Institute, WHO, International Vaccine Access Centre of the John Hopkins University Bloomberg School of Public Health, and Sabin Vaccine Institute, recommended that countries with endemic of dengue and interested to implement dengue vaccine programme to prepare the necessary groundwork to ensure introduction of vaccines is faster and more effectively. These include prepare for licensing decisions, conduct surveillance and develop immunisation, financing and communications strategies. In addition to dengue vaccines, development of antiviral drugs as an alternative to vaccinations also shows good progress. Once effective antiviral drugs are developed, they could potentially be administered to people with or without a fever to decrease or prevent disease symptoms at the first sign of a dengue outbreak.

To reverse the trends of increased incidence and geographic expansion of epidemic dengue infections, all of the technologies both old and new that are available need to be used. This includes integrated use of chemical, biological and genetic control for mosquito’s control, combined with community involvement and a top-down bottom-up strategy that includes the use of vaccines and drugs as they come online. Challenges ahead including on the ethical issues of using biologically-based insecticides such genetically modified mosquitoes should not be allowed to prevent it use in dengue control programmes. The same applies to the dengue vaccines and therapeutic antibodies in the pipeline, most of which are also genetically modified, and therefore potential ethical issues.

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