



Research articles

Dengue fever- a worldwide studyVijay Kumar^{1*}, Shipra Gupta¹, Rupa Khanna²¹Graphic Era Hill University Dehradun, Uttarakhand, India²Graphic Era Deemed to be University Dehradun, Uttarakhand, India**ABSTRACT**

Nowadays, after coronavirus COVID 19, dengue fever is a problem of human beings that is spread by the *Aedes aegypti* mosquitoes. If proper protection arrangements from the particular mosquitoes are not done, this problem may lead to a pandemic. The main problem of this fever is that the starting symptoms are the same as viral fever as high fever, myalgia, muscular and joint pain, hemorrhagic episodes, and cutaneous rash. The purpose of this manuscript is to aware people of this health problem. Near the rain season, the problems of mosquitoes are increased. The awareness of the people could prevent this disease. In this manuscript, an analytic study on the worldwide dengue fever has been made. It is observed that after 2010, the cases of dengue fever are increased continuously. People should keep neat and clean their surroundings and cover maximum part of the body.

Keywords: Dengue Fever, Worldwide Study, Health Problem, Mosquitoes, Level of Risk

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INTRODUCTION

Dengue fever is a viral infection transmitted by mosquitoes, found in tropical and subtropical climates and humidity worldwide, mainly in urban and semi-urban areas. Dengue contamination is a disease that causes dengue fever (DENV). There are four serotypes of DENV, which means the infection may occur at different times. Dengue fever in people has been a nuisance for health offices in the last few years. Mosquitoes that spread dengue fever are typically found below 6,500 feet. The chances of contracting dengue fever from mosquitos residing above that height are quite slim^[1, 2].

While certain DENV pollutions cause moderate illness, DENV can induce a severe flu-like illness. Inconsistently, this develops into the potentially fatal disease dengue fever. Dengue fever is a major source of natural disease and destruction in various Asian and Latin American countries. It necessitates the formation of a clinical specialists' board. Dengue/outrageous dengue do not have a specific treatment. Early detection of illness development linked to genuine dengue and introduction to appropriate clinical thinking reduced excessive dengue loss rates to less than 1%. The total recurrence of dengue fever has been steadily increasing for many years. A significant portion of the whole population is currently in grave danger. Regularly, there are between 100 and 400 million

defilements. Effective vector control methods are necessary for dengue prevention and management. Supported social class affinity can also help to expand vector control efforts^[3, 4].

Dengue fever is a mosquito-borne viral disease that has recently expanded throughout all WHO regions. Dengue fever is transmitted by female mosquitoes, mainly *Aedes aegypti* and, to a lesser extent, *Aedes* mosquitoes, white nematode. These mosquitoes also carry chikungunya fever, yellow fever and Zika virus contaminants. Dengue fever lingers in the desert, and there are countless near-dangerous dangers due to the weather, temperature, and density associated with rapid urbanization. A wide range of contaminants is developed due to dengue. It can range from mild illness to actual symptoms of flu in those who are contaminated. Surprisingly, some people also promote the dreaded dengue, which can have many responsibilities related to biting the dust, a physical barrier such as plasma wasting. Real dengue is in serious danger of death if it is not properly identified. Real dengue first appeared in the 1950s during the dengue epidemic in the Philippines and Thailand. Today, severe dengue is affecting countries in Asia and Latin America and has evolved into a major source of hospitalization and transit between children and adults here. The Flaviviridae disease is

diagnosed as dengue fever, and four closely related serotypes cause dengue fever (DENV1, DENV2, DENV3, and DENV4). It is recognized that the recovery of impurities gives this serotype unlimited resistance. However, the inconsistency of the following serotypes after recovery is only sporadic and transient [5]. After diseases (cognitive impairment) caused by other serotypes, the risk of dengue fever increases. Dengue fever has a specific epidemiological model related to the four pollutant serotypes. This can spread collaboratively within space, and certainly, different countries have the most complement to all four serotypes. Dengue is exerting a tremendous influence on both human and international prosperity.

DENV is regularly deployed as a precautionary measure, starting with one location and then moving on to the next by corrupt explorers; when the proposed carriers are free in these new regions, there is a possibility of setting up neighboring transfers. Following the epidemic, the problem of dengue fever developed. This problem is certainly not a transmitted disease. You can't move start with one person and move on to the next. Many provinces are dealing with dengue fever. In Firozabad, Mathura, and Uttar Pradesh, dengue fever is spreading rapidly in Kanpur and Prayagraj. In Kanpur, about 100 patients with the flu regularly arrive at the emergency clinic, while 97 dengue patients have been reported from Prayagraj. According to the Wellbeing Division, approximately 75-100 patients experiencing the flu arrive at the medical clinic consistently, and cases may increase further if the formal system does not. Dengue conditions are additionally announced from Prayagraj. 97 cases of dengue have been confirmed, and patients are being treated. No transfer has been reported as dengue so far. According to one report, another 16 people, including seven minors, have died of dengue and virus fever in Kanpur and Braj (Mathura). Nine people, including six children, kicked a bucket at Firozabad, three in Kasganj, one in Etah and three in Kanpur (September 14, 2021).

In 2010 dengue fever was approved to infect 50 to 100 million people worldwide each year with 1/2 of the deadly diseases. There has been a dramatic increase in repetition elsewhere in the 1960s and 2010s, with a 30-fold interval. These increases have been welcomed due to a combination of urbanization, human development, global travel, and global warming. Geographical distribution is around the equator, with 70% of the total population of 2.5 billion people living in Asia and the Pacific regions. The vast majority of people contaminated during an outbreak are not tested for the virus. In this way, their illnesses can also be expected from measles, mumps, or other significant infections [6, 7].

The epidemic first appeared in Asia, Africa, and North America simultaneously in the 1780s. In the 1950s, a pandemic broke out in Southeast Asia, and DHF became the main cause of death.

Mostly the youth population were affected of that region in 1975. An important example of DHF was represented in Manila from 1953 to 1954. Then, different young people became obstacles to this new result. Dengue fever, which causes dengue fever, has been common since the 1980s. In the late 1990s, dengue fever was the main mosquito-borne disease that affected people after intestinal diseases. There were about 40 million cases of dengue fever and hundreds of thousands of hemorrhagic fever cases every year. Severe attacks of dengue fever usually occur every five or six months. The onset and severity of dengue fever cases are believed to result from intermittent periods associated with dizziness in each of the four types of dengue fever patients. In the only place where the disagreement is unclear, the public can't help broadcasting it to where the next climax will occur. In this way, because of the four different serotypes of dengue infection and the existence of unknown persons, many people in affected areas that have previously occurred are at risk of work or travel [8, 9].

Dengue disease reason diverse by mosquitos. This can vary from slight infection (human beings might not realize they're infected) to critical facet out, including flu in the one inflamed. Although much less not unusual place, a few human beings sell sturdy dengue, which can be some issues associated with critical dying, organ obstruction, or capacity plasma leakage. Sturdy dengue is at excessive threat of dying if now no longer dealt with well. Strong dengue was first regarded inside the mid-1950 throughout the dengue epidemics inside the Philippines and Thailand^[10,11]. Today, extreme dengue regularly affects international locations in Asia and Latin America and has been a main supply of hospitalization and dying amongst kids and adults in those regions. The Flaviviridae own circle of relatives enveloped RNA virus. There are four kinds of dengue-inflicting infections (DENV-1, DENV-2, DENV-3 and DENV-4).

Emerging pollutants (helper sickness) through different serotypes grow the threat of growing extreme dengue. Recovery from impurities is typical to provide an extended-lasting impact in opposition to that serotype. In any case, the vulnerability to the next serotypes after healing is simplest mild and short. Dengue has a few epidemiological examples associated with the four serotypes of the sickness^[12]. This may be shared throughout the location and ensure that maximum countries are hyper-endemic to all four serotypes. Dengue influences human health and the worldwide and social economy. DENV is typically dispatched first to at least one vicinity, after which to the following through grimy vacationers. At the same time, endangered vectors are determined in those new regions, and there is a risk that a close-by transmission may be set. Weight loss global: The prevalence of dengue has grown substantially global over

the years. The maximum essential part of asymptomatic or slight and impartial instances, and as a result, the total quantity of dengue instances has now no longer been well disclosed. Many sufferers' areas were prone to different ailments as non-sufferers. Distribution and dengue outbreak: Before 1970, simplest nine international locations skilled a pandemic. The contamination spreads extensively in more than a hundred international locations in WHO Africa, the Americas, the Eastern Mediterranean, Southeast Asia, and the Western Pacific^[13]. The United States, Southeast Asia, and the Western Pacific location had been the worst affected, and Asia accounted for approximately 70% of the worldwide diseased frame weight. As the sickness spreads to new regions along with Europe, now no longer simplest the quantity of instances is increasing, however additionally risky episodes.

The threat of a dengue fever conspiracy can also additionally arise in Europe; in 2010, there had been transferred instances from neighbouring international locations apart from France and Croatia, and imported instances had been determined in 3 different European international locations. Cases had been filed in crucial Portugal and ten unique European international locations. In many European international locations, indigenous instances are determined at special places each year. For vacationers from low- and middle-earnings international locations, dengue fever is the second one maximum, not unusual place motive of influenza showed after intestinal diseases^[14,15]. The maximum massive quantity of dengue instances at any time introduced global became 2019. By 2020, dengue affected numerous countries, with improved instances in Bangladesh, Brazil, the Cook Islands, Ecuador, India, Indonesia, Maldives, Mauritania, Mayotte (Fr), Nepal, Singapore, Sri Lanka, Sudan, Thailand, Timor-Leste and Yemen. By 2021, dengue will affect Brazil, the Cook Islands, Colombia, Fiji, Kenya, Paraguay, Peru and Get-together. All that local possession has been affected, and the switch of dengue became recorded in Afghanistan interestingly^[16]. In addition, a 53% discount in extreme dengue instances became additionally recorded in 2017. The timing of the post-Zika episode (after 2016) noticed a decline in dengue diseases, and the precise reasons for this decline aren't clear.

Transmission Human-to-human transmission: The contamination is transmitted to humans' beings through inflamed girl mosquitoes, especially *Aedes aegypti*. Different species of the *Aedes* own circle of relatives also can tour as porters. However, your dedication enables *Aedes aegypti*. After someone is inflamed with DENV benefits, the contamination returns to the mosquito's backbone, after which it spreads to unselected tissues, along with the salivary glands. The time from the contamination of the sickness to the real transmission to any other supervisor is the outside, outside

session phase (EIP). EIP takes about 812 days at an ambient temperature of 2528 °C. Other ERP elements, including day by day length with day by day temperature changes, kind of contamination, and the onset of viral contamination, can modify the time it takes for mosquitoes to transmit contamination. If left unchecked, mosquitoes can unfold sickness in the course of the relaxation in their lives. Human-to-mosquito transmission: Mosquitoes may be infected through those who exercise viremic with DENV. This can be someone with dementia, someone who will nevertheless have sexually transmitted infections (pre-existing). However, those who do now no longer display any symptoms and symptoms of the sickness again (no signs and symptoms).

Transmission of mosquitoes may be an accomplished simplest day earlier than the individual turns ill, so long as the flu is solid for two days. The threat of mosquito infection is strongly connected to excessive viremia and excessive fever within the affected person; on the other hand, planters of antibodies that explicit DENV are related to a discounted threat of mosquito-borne sickness (Nguyen et al. 2013 PNAS). Most human beings get viremia for approximately four-five days. However, viremia can preserve to upward push for as much as 12 days. Various modes of transmission: An essential technique of transmission of DENV amongst human beings includes mosquito repellent. There is proof of whether or not there's an opportunity for maternal transmission (from a pregnant mom to her child). At the same time, vertical transmission's degrees imply a decrease, with the threat of vertical transmission related to a nation of dengue infection throughout pregnancy. When a mom has a DENV infection throughout pregnancy, toddlers can enjoy the bad outcomes of prenatal start, low start weight, and fetal distress. Attributes of contamination (signs and symptoms and facet outcomes): Dengue is an acute infection, including the flu that influences kids, younger kids and adults. However, it now and then reasons dying. Adverse outcomes typically persist for 2-7 days, after a drying duration of four to ten days after ingestion of infected mosquitoes.

The World Wellbeing Association classifies dengue into essential categories: dengue (with empty markings) and dengue. A small order of dengue without or with observing symptoms and symptoms is meant to help fitness specialists with emergency sufferers be licensed inside the clinic, make certain near understanding, and decrease the threat of growing severe dengue. Symptoms: Dengue should be blamed while excessive fever (40 ° C / 104 ° F) is observed through 2 related signs and symptoms throughout the febrile phase: extreme migraine, eye trauma, muscle and joint ache, infection, vomiting, enlarged limbs, rash. Diagnostics: A few strategies may be used to hit upon DENV infection. This

consists of virologic assessments (which at once distinguish the additives of contamination) and serological assessments, which hit upon non-human additives which are decided through the sickness). Amassed affected persons throughout the seven-day infection duration should be evaluated through serological and virologic strategies. Depending on the hour of the affected person's presentation, using many signalling strategies can be pretty effective^[17].

Virologic Strategies: Infection can be removed from the bloodstream throughout the onset of the sickness and now no longer for a prolonged time. However, they require sure tools and unique coaching for the take a look at workers. In line with those lines, they're typically now no longer to be had in all scientific offices. Infection also can be differentiated through checking out an inflamed protein, known as NS1. There are short demonstration assessments accomplished with getting admission to this as it takes ~ 20 mins to decide the result. The take a look at does now no longer require any precise lab or hardware strategies^[18]. **Serological Strategies:** For example, proteins connected to preventive measures (ELISA) can affirm the latest or vintage contaminants' invention by figuring outage and IgGin opposition to dengue antibodies. IgM antibodies appear ~ one week after contamination and are maximum significant into approximately a month after the onset of the sickness. They stay significant for approximately ninety days. The presence of IgM is a characteristic of the brand new DENV syndrome. IgG neutralizer degrees have set apart a more innovative attempt than IgM. However, IgG remains with inside the frame for a long time. The presence of IgG suggests beyond impurities. **Treatment:** There isn't any precise remedy for dengue fever. Reducing fever and lowering ache can manage the facet outcomes of painful muscles, ache, and fever. Other remedies for those facet outcomes are acetaminophen or paracetamol^[19].

Stay far from NSAIDs (non-steroidal anti-inflammatory pills including ibuprofen and topical pills). The worst-case state of affairs is that, thinking about the effect and motion of medical doctors and healthcare companies to address the sickness, as a lot as 20% too much less than 1% of lives may be saved. The quantity of fluid that helps the affected person is vital for the in-depth remedy of dengue fever. If caution symptoms and symptoms appear, sufferers with dementia ought to be searching for a scientific referral^[20].

Dengue Vaccination

The dengue antibacterial antibody Dengvaxia (CYDTDV) advanced via Sanofi Pasteur was turned into authorized in December 2015 and has been permitted via way of means of administrative specialists in approximately 20 international locations/regions. In November 2017, the consequences of similarly checked to decide the dedication of serum repute with inside the research confirmed that a

small organization of early individuals who selected to rule the energy at the time of preliminary discovery confronted better climate waves of anger and were hospitalized for too lengthy as uninvited guests^[21]. Similarly, antibodies are aimed toward those who stay in rural areas, are 945 years old and older, and are afflicted by sicknesses like the one formerly located in dengue infections. WHO's a function inside the CYDTDV vaccine: As said in the WHO Dengue Vaccination Document (September 2018), the early medical literature has proven a stay, vulnerable dengue vaccine CYDTDV is influential and powerful in humans. However, it does switch the improved hazard of excessive dengue fever to those who first increase it after Vaccination^[22].

For international locations thinking about Vaccination as a part of their dengue manipulate plan, pre-vaccination trying out is recommended. In this manner, most influential people with proof of dengue fever records could be accepted (as an opponent or a take a look at the result of a registered studies middle that has shown dengue contamination). The choice to behaviour pre-vaccination is trying outcalls for careful screening on the countrywide level, including info of interruptions and accessibility and latest trying out, write-off of sickness transmission studies, clean country-precise hospitalization rates, and understanding of CYDTDV and trying out.

Vaccines Vaccination has to be considered as part of the anti-dengue fever application blended with the manipulate application. There is an on-going want to stick to different techniques of sickness prevention, for example, initial dosage and vector help supported^[23]. If they may be vaccinated, people have to forget quick medical attention if a dengue-like look occurs. Contraindications to manipulate: As quickly as you spot dengue, prevent getting every other mosquito infestation throughout the seven-day infection period. The contamination can also additionally flow inside the blood throughout this time. That's why you may transmit new, uninfected mosquitoes that may infect others in that manner. The proximity of a mosquito-infested tree to human habitation is a hazard to heaven, relying on the type of sicknesses the Aedes mosquito comes in touch. The primary manner to manipulate or save you the transmission of dengue contamination is to combat mosquito-borne parasites^[24].

Table 1: Worldwide number of affected and deaths cases of dengue fever

Year	Name of countries	Number of affected cases	Death cases
2008	Rio de Janeiro	55000	30
2009	Argentina	9763	
	Bolvia	31000	18
	Australia	717452	
2010	Latin America	1.5 million	
	Puerto Rico	5382	20
	Pakistan	5000	31
2011	Philippines	18,885	115
	Brazil	56,882	39
	Paraguay	27,000	31
2012	Island of Madeira	2000	
	Thailand	52008	50
2013	Brazil	205000	

	Peru	400	
	Paraguay	70,000	35
	Thailand	150000	50
	Laos	11000	44
	Singapore	14000	6
	Malaysia	10500	22
	Philippines	42500	200
2014	Tokyo	3400	
2015	Taiwan	2 million	
	Hawaiian Islands	190	
	Thailand	4000	
2016	India	99913	220
	Argentina	24	
	Thailand	8000	
	America	2.38 million	
	Brazil	1.5 million	1032
	Western Pacific region	375000	
	Philippines	176411	
	Malaysia	100028	
	Solomon Island	7000	
	Africa region	1061	
2017	India	129166	245
	Kerala	6808	13
	Sri Lanka	180000	301
	America	584263	
2018	India	188401	325
	India	101192	172
2019	Bangladesh	101000	50
	Philippines	420000	600
	Marshall Islands	276	1
	Oman	59	
	Mexico	41,505	191
	Jalisco	11,727	49
	America region	3.1 million	1530
	Malaysia	131000	
2020	Vietnam	320000	
	India	157315	166
2020	Nicaragua	2,271/ 100,000 population	
	Belize	1021	
	Honduras	995	
	El Salvador	375	
	Bolivia	7700	
	Mexico	24313	79
	Jalisco	5362	20
	Tabasco		9
	Michoacan	2,517	
	Brazil	1.1 million	400
	Singapore	33500	29
	India	39419	56
2021	India (till July)	14044	4

Figure 1: Variation in the number of dengue cases concerning countries [23]

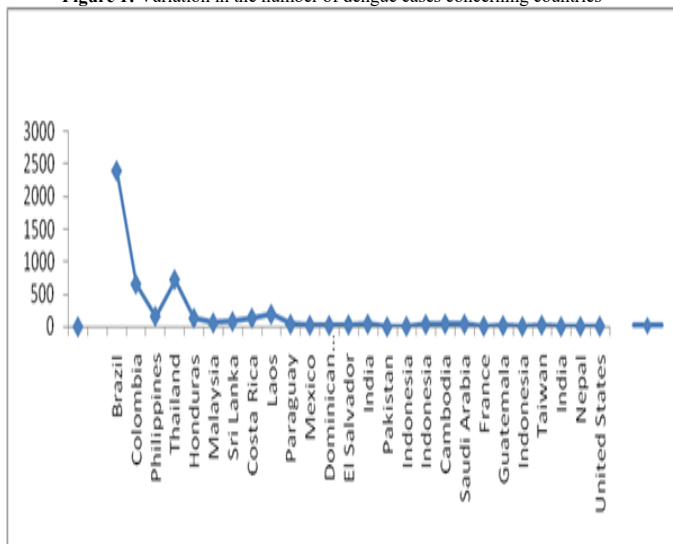


Table 2 (a): The countries which are in the level of risk of dengue in sporadic/uncertain condition [22]

Risk	African Countries	Asian Countries	European countries	Americas	Oceania/Pacific Islands
Sporadic /Uncertain	Angola, Benin, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo, Cote d'Ivoire, Egypt, Equatorial Guinea, Gabon, Gambia, Ghana, Guinea, Namibia, Guinea-Bissau, Liberia, Madagascar, Malawi, Mali, Mauritius, Mayotte, Mozambique, Niger, Nigeria, Reunion, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, South Sudan, Togo, Uganda, Zambia, Zimbabwe	Afghanistan, Aksai Chin, Hong Kong, Iran, Jammu and Kashmir, Japan, Macau, Oman, Republic of Korea, Singapore	Croatia, France, Madeira Islands	Anguilla, Bermuda, Ecuador, Montserrat, Uruguay	Kiribati, Marshall Islands, Nauru, Niue, Northern Mariana Islands, Samoa, Tokelau, Tuvalu, Vanuatu, Wallis and Futuna

Table 2 (b): The countries which are in the level of risk of dengue in frequent/continuous condition [22]

Risk	African Countries	Asian Countries	Americas	Oceania/Pacific Islands
Frequent/Continuous	Burkina Faso, Djibouti, Eritrea, Ethiopia, Kenya, Somalia, Sudan, United Republic of Tanzania,	Bangladesh, Bhutan, Brunei, Darussalam, Cambodia, Indonesia, Lao, People's Democratic Republic, Malaysia, Myanmar, Nepal, Philippines, Sri Lanka, Taiwan, Thailand, Timor-Leste, Viet Nam, Yemen	British Virgin Islands, Cayman Islands, Chile, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, El Salvador, French Guiana, Grenada, Guadeloupe, Guatemala, Guyana, Haiti, Honduras, Jamaica, Martinique, Netherlands Antilles, Nicaragua, Panama, Paraguay, Puerto Rico, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago, Turks and Caicos, United States Virgin Islands, Venezuela, Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Bolivia, Brazil	American Samoa, Australia, Cook Islands, Fiji, French Polynesia, Maldives, Micronesia (Federated States of), New Caledonia, Palau, Papua New Guinea, Solomon Islands, Tonga

Table 2 (c): The countries which are in the level of risk of dengue

Risk	African Countries	Asian Countries	Americas	Oceania /Pacific Islands
Risk varies based on region		China, India, Pakistan, Saudi Arabia	Argentina Mexico Peru	

RESULT

For some countries, dengue fever has become a significant problem. Sometimes this problem behaves like a pandemic. In this manuscript, the worldwide data of dengue fever is collected from various sources. The data is tabulated concerning worldwide regions, years, a worldwide number of affected and death cases, affected and death cases in the different states of India. Table 1 represents the

worldwide number of affected and deaths cases of dengue fever. It is observed that in 2008, the number of affected dengue cases in Rio de Janeiro was 55,000, with 30 deaths. In 2009, the maximum cases were in Australia. The total affected cases were 717452. 1.5 million affected cases of dengue fever were observed in Latin America in 2010. In 2011, the maximum cases were 56,882, and these were observed in Brazil. The maximum patients of with dengue fever were found in Thailand in 2012. The total numbers of cases were 52008. In 2013, again, maximum cases (205000) were in Brazil. 2 million people were affected in Taiwan in 2015. In 2016, 2.38 million patients were found in America. The cases become decreased in the next year. The cases became 584263 in 2017. In India, about one lakhs case was observed with 172 deaths in 2018. In 2019, 3.1 million cases were found in the American region, with 1530 deaths. In 2020, when the whole world was facing the pandemic of COVID, 1.1 million cases were found in Brazil, with 400 deaths^[25].

Figure 1 and 2 shows the variation in the number of dengue fever and death cases in worldwide countries. As per the above figures, the average infected patients were in Brazil and death cases were in Colombia. In India, it is found that every year the people of Pondicherry are affected maximum from dengue fever. Worldwide, in view of dengue fever, the countries are divided into three categories. The countries, in which the dengue fever was in sporadic/uncertain risk, are called the first category. Table 2 (a) shows that in this category, the people of 43 countries of the African region, 11 countries from the Asian region, four countries from the European region, four countries from the American territory and ten countries from Oceania/pacific islands were suffering from this problem. In some countries, the issues of dengue fever are repeated again and again. These countries are counted in the second category. Table 2 (b) represents that in this category, the people of 10 countries of the African region, 18 countries from the Asian region, 47 countries from the American territory and ten countries from Oceania/pacific islands were suffering from this problem. As per table 2 (c), in Asian countries in India, Pakistan, China and Saudi Arabia, the dengue fever cases varied in various regions. In Argentina, Mexico, and Peru, of the American region, the dengue cases were like to give four Asian countries above.

CONCLUSION

From the above analysis of worldwide dengue fever cases of various countries, it is concluded that before 2008, dengue fever cases were much fewer. After 2010, in some countries, the cases of dengue fever become millions. It is also observed that after 2014, the cases in India was increased very rapidly. The affected cases of dengue fever in Brazil are more than in other countries, and every year the cases in Brazil are growing. The death cases due to dengue

fever are increasing in Colombia. It is found that the numbers of countries of such countries are more in which dengue fever is repeated again and again, and numbers of affected patients are more than uncertain cases.

From the above discussion, it is suggested to the people of the whole world that we follow all the instructions the health department gives. We should follow the guidelines of dengue fever prevention. We should follow the principle that precaution is better than cure.

In conclusion, from above study it was observed that exposure to allergens triggers a series of allergic reactions which can further progress into Severe Respiratory Disease. Avoidance of allergens exposure may decrease the onset of respiratory diseases.

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