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EDITORIAL / EDITORIAL

Battling the Rising Tide: Challenges in Controlling Chikungunya in Latin America

Luchando contra la marea creciente: desafíos para controlar el chikungunya en América Latina

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Chikungunya, a mosquito-borne viral disease, has rapidly emerged as a pressing public health concern in Latin America since late 2013, posing significant challenges to control efforts across the region[1, 2]. The rapid spread of the disease during 2024-2025, coupled with limited resources, infrastructure, and other factors, has exacerbated the situation. However, the Latin American public health community has demonstrated remarkable resilience, requiring a coordinated and multifaceted approach to combat this persistent threat[3].

One of the primary challenges in controlling Chikungunya in Latin America lies in the complex interaction between the virus, its vectors, and the environment. Environmental factors such as temperature and humidity influence the distribution and abundance of *Aedes* mosquitoes, the primary vectors of the Chikungunya virus (CHIKV). In regions with favorable environmental conditions, vector populations thrive, increasing the risk of disease transmission. Urbanization and population growth have also created breeding grounds for mosquitoes, further facilitating the spread of Chikungunya. Addressing these environmental determinants requires not just efforts but sustained and persistent efforts in vector surveillance and control and community engagement to promote environmental management practices. The urgency of this task cannot be overstated[4, 5].

The current situation in the region is concerning. In 2023, 410,754 cases were reported in the Americas region **(Table 1)**. The highest number is in Brazil (265,503), followed by Paraguay (140,095). In 2023, 419 deaths were associated with CHIKV (Table 1). During the ongoing 2024, in just a few months, 204,889 cases have been reported **(Table 2)**, 201,092 in Brazil and 3,206 in Paraguay **(Table 2)**. Additionally, 75 deaths due to CHIKV have already been reported in 2024 **(Table 2).**

Despite that, multiple countries have reported CHIKV in 2022-2024 **(Figure 1)**, showing the relevant geographical spread in the region. CHIKV has become a significant arboviral disease in the region, and after dengue, it is a significant concern in the context of arboviruses circulating[6].

Furthermore, the mobility of populations within and across borders presents a significant challenge to Chikungunya control efforts in Latin America. Migration, trade, and tourism contribute to the rapid dissemination of the virus, which has been analyzed in some countries of the region[7]. High levels of human movement facilitate the introduction of the virus into new areas where susceptible populations may lack immunity, leading to outbreaks and epidemics[8]

Effective surveillance systems and cross-border collaboration are essential for early detection and response to imported cases, preventing the establishment of sustained transmission chains. As public health professionals, policymakers, researchers, and stakeholders, your role in this is crucial. Moreover, addressing migration's social and economic drivers, such as poverty and conflict, can help mitigate the underlying risk factors for Chikungunya transmission[9, 10].

The burden of Chikungunya falls disproportionately on vulnerable populations in Latin America, including the poor, marginalized communities, and indigenous groups[11-14]. Multiple studies highlight the social determinants of health contributing to the unequal distribution of Chikungunya burden, including inadequate housing, limited access to healthcare, and poor sanitation conditions[11-14]. These disparities exacerbate the disease's impact, leading to higher morbidity and mortality rates among disadvantaged populations. Addressing health inequities requires a comprehensive approach that integrates health promotion, access to healthcare services, and social welfare programs to improve the resilience of vulnerable communities and reduce their vulnerability to Chikungunya and other vector-borne diseases[11-14]. In addition, CHIKV may lead to chronic infection, which has been previously observed and confirmed in some countries in the region[15-22].

Inadequate healthcare infrastructure and diagnostic capacity pose significant challenges to the timely detection and management of Chikungunya cases in Latin America. Some studies highlight the limitations of current diagnostic methods for Chikungunya, particularly in resource-limited settings where access to laboratory facilities is limited[23]. Misdiagnosis and underreporting of cases hamper surveillance efforts and hinder the implementation of targeted control measures. Strengthening laboratory capacity, training healthcare workers, and enhancing public awareness are essential components of an effective response to Chikungunya, enabling early detection, diagnosis, and treatment of cases[23].

In conclusion, the control of Chikungunya in Latin America presents multifaceted challenges that require a comprehensive and coordinated response from governments, healthcare systems, and communities[7]. Addressing environmental, social, and healthcare factors is essential for mitigating the disease's impact and preventing future outbreaks. By investing in vector surveillance and control, strengthening healthcare infrastructure, and addressing health inequities, Latin American countries can enhance their resilience to Chikungunya and improve the health and well-being of their populations[24].

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Table 1. Chikungunya cases by country or territory in 2023, according to the Pan American Health Organization (https://opendata.paho.org/en)

Select Country or Subregion: (All) | Select Year: 2023 | As of Epidemiological Week: 53

ID	Country or Subregion	Date of Last Report	Last Case Reported	Last Epidemiological Week Reported (a)	Total Cases (b)	Cumulative Incidence (c)	Confirmed	Imported	Deaths	Population x 1000
1	Canada	2023-12-30	---	52	0		0	0	0	0
	United States of America	2023-12-30	2024-04-13	52	0	0.00	0	101	0	332,915
	North America (minus Mexico)	---	---		0	0.00	0	101	0	332,915
2	Belize	2023-08-05	2023-07-29	31	272	61.68	0		0	441
	Costa Rica	2023-12-30	2023-12-30	52	91	1.73	26		0	5,262
	El Salvador	2023-12-16	2023-12-02	50	63	0.97	0		0	6,519
	Guatemala	2023-12-30	2023-12-30	52	200	1.10	1		0	18,250
	Honduras	2023-09-30	2023-09-16	39	9	0.09			0	10,063
	Mexico	2023-12-30	2023-09-09	52	2	0.00	2		0	131,230
	Nicaragua	2023-12-30	2023-01-28	52	3	0.04	0	0	0	6,702
	Panama	2023-08-05	2023-08-05	31	42	0.94	42	0	0	4,457
	Central America and Mexico	---	---		682	0.37	71	0	0	182,924
3	Bolivia	2023-12-30	2023-12-30	52	1,468	12.41	2		0	11,833
	Colombia	2023-12-30	2023-12-23	52	52	0.10	0		0	51,266
	Ecuador	2023-12-30	2020-06-27	52	0	0.00	0	1	0	17,888
	Peru	2023-12-30	2023-12-30	52	139	0.42	70		0	33,359
	Venezuela	2023-05-27	2023-05-27	21	173	0.60	12		0	28,705
	Andean Subregion	---	---		1,832	1.28	84	1	0	143,051
4	Argentina	2023-12-30	2023-12-30	52	1,746	3.83	1,746		0	45,606
	Brazil	2023-12-30	2023-12-30	52	265,503	124.07	154,129		122	213,993
	Chile	2023-12-30	---	52	0	0.00	0	7	0	19,212
	Paraguay*	2023-12-30	2023-12-30	52	140,905	1,865.30	83,522		297	7,554
	Uruguay	2023-12-30	2023-06-10	52	85	2.44	85		0	3,485
	Southern Cone	---	---		408,239	140.84	239,482	7	419	289,850
5	Cuba	2019-12-28	---							11,317
	Dominican Republic	2015-01-03	2015-01-03							10,954
	Puerto Rico	2023-12-30	2017-04-08	52	0	0.00	0		0	2,828
	Latin Caribbean	---	---		0	0.00	0		0	25,099
6	Barbados	2023-12-30	2023-10-14	52	1	0.33	1		0	302
	French Guiana	2018-06-30	2018-06-30							306
	Grenada	---	---							114
	Jamaica	2023-12-30	2019-11-02	52	0	0.00	0		0	2,973
	Saint Lucia	2023-12-30	2021-04-17	52	0	0.00	0	0	0	167
	Suriname	2023-12-30	2019-10-05	52	0	0.00	0		0	592
	Virgin Islands (US)	2023-12-30	---	52	0	0.00	0	0	0	106
	Non-Latin Caribbean	---	---		1	0.00	1	0	0	20,433
7	The Americas	---	---		410,754	41.31	239,638	109	419	994,272

Table 2. Chikungunya cases by country or territory in 2024 (first trimester), according to the Pan American Health Organization (https://opendata.paho.org/en)

Select Country or Subregion: (All) | Select Year: 2024 | As of Epidemiological Week: 53

ID	Country or Subregion	Date of Last Report	Last Case Reported	Last Epidemiological Week Reported (a)	Total Cases (b)	Cumulative Incidence (c)	Confirmed	Imported	Deaths	Population x 1000
1	Canada	2024-04-13	---	15	0		0	0	0	0
	United States of America	2024-04-13	2024-04-13	15	17	0.01	17	0	0	332,915
	North America (minus Mexico)	---	---		17	0.01	17	0	0	332,915
2	Belize	2024-03-16	2023-07-29	11	0	0.00	0		0	441
	Costa Rica	2024-03-30	2024-03-23	13	10	0.19	0		0	5,262
	El Salvador	2024-04-06	2024-04-06	14	15	0.23	0		0	6,519
	Guatemala	2024-04-06	2024-03-09	14	10	0.05	2		0	18,250
	Honduras	2024-02-17	2024-02-17	7	2	0.02	0		0	10,063
	Mexico	2024-04-13	2023-09-09	15	0	0.00	0		0	132,308
	Nicaragua	2024-02-03	2023-01-28	5	0	0.00	0		0	6,702
	Central America and Mexico	---	---		37	0.02	2		0	184,002
3	Bolivia	2024-04-13	2024-04-13	15	268	2.26	0		0	11,833
	Colombia	2024-04-13	2024-03-23	15	20	0.04	0		0	51,266
	Ecuador	2024-04-06	2020-08-27	14	0	0.00	0	0	0	17,888
	Peru	2024-04-13	2024-04-13	15	43	0.13	3		0	33,359
	Andean Subregion	---	---		331	0.29	3	0	0	114,346
4	Argentina	2024-04-13	2024-04-13	15	206	0.45	206		0	45,606
	Brazil	2024-04-20	2024-04-20	16	201,092	93.97	133,027		75	213,993
	Chile	2024-04-13	---	15	0	0.00	0	0	0	19,212
	Paraguay*	2024-04-13	2024-04-13	15	3,206	42.44	24		0	7,554
	Uruguay	2024-04-06	2023-08-10	14	0	0.00	0	1	0	3,485
	Southern Cone	---	---		204,504	70.56	133,257	1	75	289,850
5	Puerto Rico	2024-03-30	2017-04-06	13	0	0.00	0		0	2,828
	Latin Caribbean	---	---		0	0.00	0		0	13,782
6	Barbados	2024-03-02	2023-10-14	9	0	0.00	0		0	302
	Jamaica	2024-03-23	2019-11-02	12	0	0.00	0		0	2,973
	Saint Lucia	2023-12-30	2021-04-17							167
	Suriname	2024-04-06	2019-10-05	14	0	0.00	0		0	592
	Virgin Islands (US)	2024-04-13	---	15	0	0.00	0	0	0	106
	Non-Latin Caribbean	---	---		0	0.00	0	0	0	7,970
7	The Americas	---	---		204,889	21.73	133,279	1	75	942,865

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Figure 1. Geographic distribution of Chikungunya cases in the Americas, 2022-2024, according to the Pan American Health Organization (https://opendata.paho.org/en)

Contribuciones: AJRM: concepción, redacción y aprobación final del manuscrito.

Declaración: Las opiniones expresadas en este manuscrito son responsabilidad del autor y no reflejan necesariamente los criterios ni la política de la RSPP y/o del INS.

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