Hepatitis B
What is happening in Latin America?

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Genomic approach to Hepatitis B infection in Latin America

- The Latin American and Caribbean region encloses Spanish, Portuguese and French speaking countries of the American Continent.

- The people of Latin America descend from at least three streams of Asian gene flow (Native Americans, Eskimo Aulet speakers and Dene-speaking Chipewyan).

- Socio-demographic transformation of the Amerindian ancestry has been influenced with European and African ancestry.

- The closely related HBV genotypes F and H are the indigenous genotypes, while the incidence of HBV genotypes A and D was the result of the admixture with European and African populations.
Pathway of hepatitis B virus in Latin America

Roman S et al- World J Gastroenterol, 2014;20 :7181-96
Genotype F is the most prevalent in the Spanish-speaking countries and in the Amerindian population in South America.

Genotype F is divided into four subgenotypes (F1 to F4).

Subgenotype F1 is further divided into F1a (found in Costa Rica and El Salvador) and F1b (found only in Alaska, Argentina and Chile).

Subgenotypes F2 and F3 cocirculate in the north of South America: F2a is found in Brazil and Venezuela, F2b is described only in Venezuela.

F3 is frequent in Colombia, Venezuela and Panama.

F4 is reported from the central and south areas of South America, including Bolivia, Argentina and southern Brazil.

World J Gastroenterol. 2014;20:7622-7634
Phylogenetic tree of the F/H genotype family of Hepatitis B
(nucleotide divergence over the complete genome)

Section A: Common ancestry  
Section B: HBV genotype F lineages  
Section C: HBV genotype H subsets

Roman S et al- World J Gastroenterol, 2014;20 :7181-96
Epidemiology of HBV in Latinamerica

Variability in endemicity

Prevalence of chronic infection:

**High**: HBsAg positive > 8% of the population

**Intermediate**: HBsAg positive 2-8%

**Low**: HBsAg positive < 2%
Prevalence of Hepatitis B in children 5-9 years

J.J. Ott, G.A. Stevens, J. Groeger, S.T. Wiersma
Vaccine, Volume 30, Issue 12, 2012, 2212 - 2219
Prevalence of Hepatitis B in adults

- < 2% Low
- 2-4% Low intermediate
- 5-7% High intermediate
- > 8% High

Prevalence of Chronic Hepatitis B in South America

- Colombia: 1.5-2.5
- Ecuador: 2.0
- Perú: 1.4-2.2
- Bolivia: 1.6
- Chile: 0.4-0.5
- Argentina: 0.8
- Paraguay: 0.9
- Uruguay: 0.9
- Surinam: 2.3
- Brasil: 8.0 (Amazone), 1.0 (SE), 2.5 (E)
Both Tropical Latin America and Central Latin America demonstrated a strong decrease in HBsAg prevalence between 1990 and 2005.

Tropical Latin America changed from an intermediate into a low endemicity region. Where 0–9 year aged boys had a higher intermediate endemicity of over 5% in 1990, HBsAg prevalence was only 1.6% in 2005.

In Central Latin America prevalence has halved in this period and most adult age-groups shifted to a low endemicity level in 2005.

Andean Latin America and Southern Latin America showed a decreasing prevalence by age but relatively constant intermediate endemicity levels.

HBV chronic infection rates in Caribbean children and adolescents aged 0–19 years ranged from 4.3% to 5.4% and fairly constant over time. HBsAg prevalence decreased with age.
### Pooled seroprevalence of chronic hepatitis B infection by immigrant class from Latinamerica

<table>
<thead>
<tr>
<th></th>
<th>Number of studies</th>
<th>Number of subjects</th>
<th>Pooled HBsAG Seroprevalence%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>18</td>
<td>29,554</td>
<td>1.7 (1.1 to 2.7)</td>
</tr>
<tr>
<td>Immigrants</td>
<td>9</td>
<td>9,539</td>
<td>1.4 (0.8 to 2.7)</td>
</tr>
<tr>
<td>Refugees</td>
<td>7</td>
<td>19,580</td>
<td>3.1 (0.8 to 11.6)</td>
</tr>
<tr>
<td>Mixed</td>
<td>2</td>
<td>435</td>
<td>0.6 (0.2 to 2.0)</td>
</tr>
</tbody>
</table>

Prevalence of hepatitis B and C among injecting drug users (IDUs) is high. For instance, the prevalence of hepatitis B core and hepatitis C antibodies in IDUs was 63.9% and 55.8%, respectively, for Brazil, and 97.4% and 85% for Mexico. Nelson PK, Mathers BM, Cowie B, Hagan H, Des Jarlais D, et al. Global epidemiology of hepatitis B and hepatitis C in people who inject drugs: results of systematic reviews. Lancet. 2011;378:571–83.

In WHO's framework for global action and PAHO's regional strategy, IDUs have been included as one of the main target populations for the prevention of VH transmission.


Nine (47%) of 19 countries in the Americas report offering free HBV and HCV testing to all citizens, Five (26%) offer it only to particular risk groups; HBV and HCV diagnosis is mandatory for particular risk groups in 15% of countries. World Hepatitis Alliance. 2010.
HEPATITIS B

CLINICAL CATEGORIES

Asymptomatic
Acute
Chronic
Fulminant
Occult

“presence of HBV viral DNA in the liver (with or without detectable HBV DNA in serum) of HBsAg-negative individuals tested with the currently available serum assays”.

A cutoff value of <200 IU/mL was also introduced for HBV DNA in serum

Hemodialysis patients, infection with human immunodeficiency virus, hemophiliacs, hepatitis C infections, certain ethnic groups and apparently healthy blood donors.

Pathogenic process leading to HCC

Initiation: The fixation of a mutation(s) in host DNA via cell division.

Promotion: Clonal expansion of mutated hepatocytes that have an increased risk of oncogenic transformation.

Progression: Steps by which members of these clonal populations evolve to become cancer cells.

Seeger C, Mason WS Virology 2015
Hepatitis B- Hepatocellular carcinoma

HBV (10.8%)

HBV+other etiology (14%)

Males 85%

By 2012, all countries had officially incorporated HBV vaccine in their vaccination schedules, corresponding, in several to a > 70% decrease in the prevalence of infection and carriers among vaccinated

As of 2005, all countries in the Americas, except Haiti and Dominica, have hepatitis B vaccine in their childhood immunization schedule

The most important factor associated with success in the vaccination of hepatitis B has been the strong commitment of country governments

Insufficient information is available at this time to assess the use of hepatitis B vaccine in healthcare workers in the Americas

13 countries/territories include a hepatitis B dose given at birth

Coverage levels for the third dose of hepatitis B are usually over 80%

28 countries use a combination vaccine diphtheria tetanus pertussi + Haemophilus influenzae type b + hepatitis B (DTP+Hib+Hep B) for infants.

Although 18 of 19 (95%) countries in the Americas report that hepatitis treatment is totally or partially funded by the government, it is clear that treatment has not been successfully implemented in all LAC.

This is likely related to the rapid evolution of recommendations for clinical management of hepatitis and the high expense of treatment.

The need for treatment and monitoring in the case of a diagnosis of hepatitis may be underestimated by the general public and health workers.

However, some countries have made enormous efforts to overcome these barriers. In the last decade, for instance, Brazil has incorporated universal access to hepatitis treatment in its public health agenda.

Clinical guidelines for HBV and HCV have been updated.

In 2010, a systematic review suggested that hepatitis B treatment is cost-effective in countries with economic profiles similar to Peru.


Hepatitis B awareness

Just a few governments in the region have funded and promoted hepatitis B awareness campaigns.

7 countries report having undertaken public awareness campaigns mostly in wider vaccination, HIV/AIDS and sexual education efforts.

Awareness campaigns usually involve collaboration with non-governmental organizations using mass media.

Commemoration of World Hepatitis Day (as called for in 2010 in resolution WHA63.18) is raising awareness and mobilize governments and resources in the fight against Viral Hepatitis. Since 2010, World Hepatitis Day campaigns launched by PAHO/WHO have focused on increasing knowledge about hepatitis, diagnosis and reducing stigma.
Hepatitis B awareness

The World Hepatitis Alliance conducted an analysis of global policy and practice related to viral hepatitis in Argentina, Bahamas, Barbados, Belize, Brazil, Canada, Colombia, Costa Rica, Cuba, Ecuador, Guatemala, Honduras, Jamaica, Panama, Paraguay, Peru, Suriname, Trinidad and Tobago, United States of America and Venezuela.

Sixteen of 20 (80%) countries report having a national strategy for HBV and/or HCV prevention and control.

In 12 (75%), a leader for the strategy has been designated, but only 5 of these (43%) work exclusively on hepatitis.

National goals with respect to prevention and control of hepatitis have been established in 14 of 19 (74%) countries, mostly focusing on hepatitis B immunization.

In some countries in the Americas, work with civil society organizations, international organizations and groups of patients has been essential for the planning and implementation of national VH programs.

World Hepatitis Alliance. Viral hepatitis: global policy. 2010
CLINICAL MANAGEMENT OF HEPATITIS B

• Viral hepatitis B still remains a serious problem in Latin America.

• There is a need to better identify high risk groups.

• The spread of HBV infection could be controlled through the implementation of immunization programmes.

• Personalized medicine strategies provide a novel framework for the prevention, management and treatment of HBV-related liver disease in Latin America.

• Governments in the region need to fund and promote hepatitis B awareness, diagnosis and treatment campaigns.