



# High Seroprevalence Of *Helicobacter Pylori* And CagA/VacA Virulence Factors in Northern Central America



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## Introduction

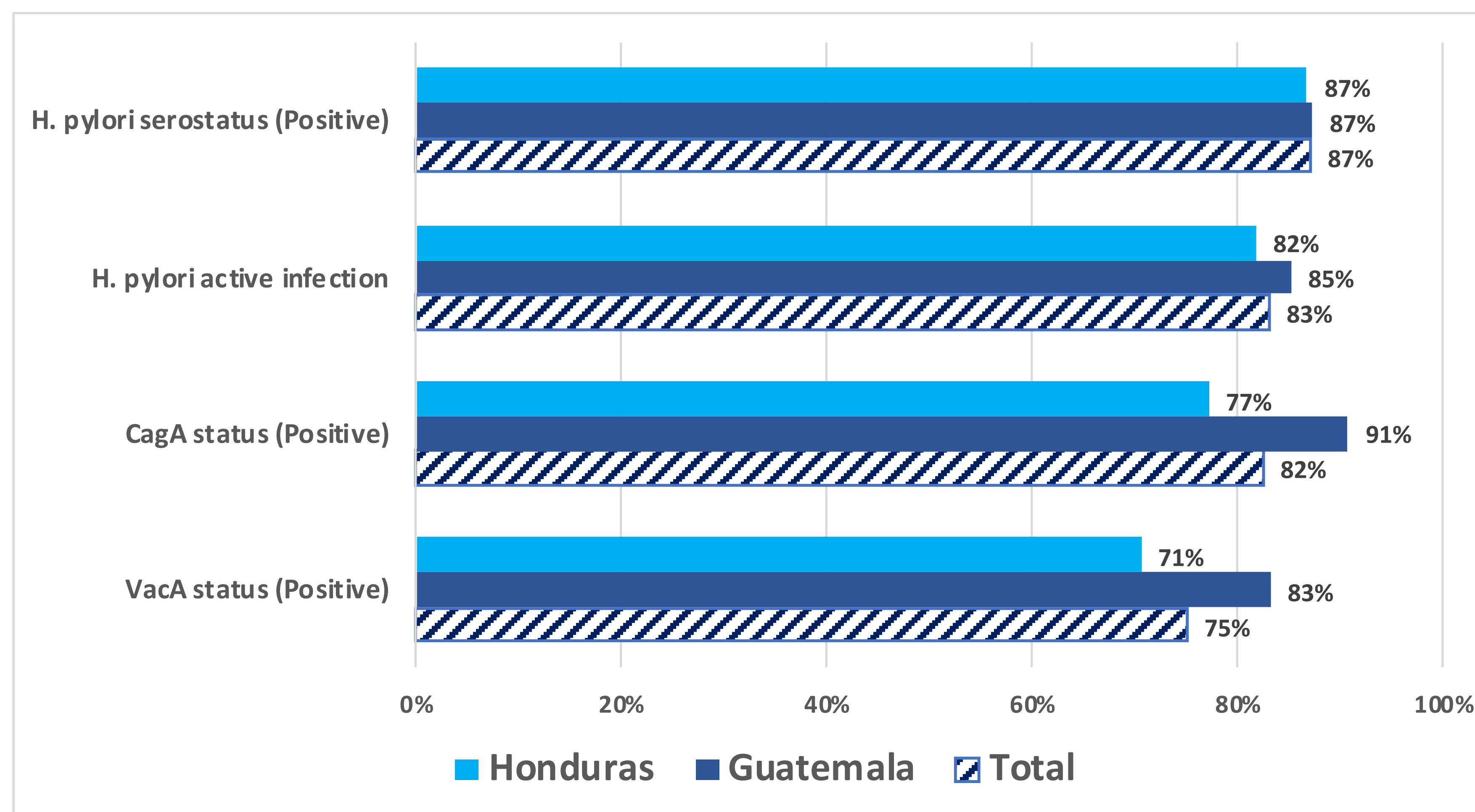
- *Helicobacter pylori* (Hp) infection is the leading cause of gastric cancer (GC).
- Northern Central America is the principal LMIC region in the Western Hemisphere and has among the highest GC incidence in the western hemisphere.
- *H. pylori* prevalence is estimated to be 80-90%.
- We examined the *H. pylori* seroprevalence, active infection status, and the Hp virulence factors **VacA/CagA** positivity of **healthy individuals** in the region using a novel validated Hp assay.

## Methods and Materials

- **Healthy volunteers** from Western Honduras and Central Guatemala were recruited.
- The novel Hp Multiplex assay (DKFZ) was used to evaluate 13 Hp antigens (CagA, VacA, GroEl, UreA, HP0231, HP0305, NapA, HpaA, HcpC, HP1564, Catalase, Cad, HyuA).
- Hp positivity was defined as positivity for  $\geq 4$  antigens.
- Active infection was defined as positivity to a combination of 2 out of the 4 antigens (VacA, GroEl, HcpC, HP1564).
- Descriptive statistics for continuous variables and frequencies for categorical variables were computed.

**Table 1. General Characteristics of the population**

	Total	Guatemala	Honduras
<b>N</b>	1143	444	699
<b>Age, mean (SD)</b>	54.2 (14.5)	55.4 (10.7)	53.4 (16.5)
<b>Sex</b>			
<b>Female</b>	615 (53.8%)	255 (57.4%)	360 (51.5%)
<b>Male</b>	528 (46.2%)	189 (42.6%)	339 (48.5%)
<b>Rural Setting</b>	683 (59.8%)	272 (61.3%)	411 (58.8%)
<b>Altitude (mamsl), mean (SD)</b>	1087.9 (453.7)	1250.8 (644.6)	983.4(209.2)
<b>Altitude &gt;1000 mamsl</b>	641 (56.4%)	272 (61.3%)	369 (53.3%)
<b>BMI, median (IQR)</b>	25.7 (22.7, 29.7)	27.4 (23.9, 30.7)	24.8(21.9, 28.7)
<b>Tobacco smoker</b>	310 (27.1%)	196 (44.1%)	114 (16.3%)
<b>Recent use of antibiotics</b>	78 (6.8%)	55 (12.4%)	23 (3.3%)
<b>Refrigerator</b>	608 (53.2%)	200 (45.0%)	408 (58.4%)
<b>Alcohol</b>	488 (42.7%)	321 (72.3%)	167 (23.9%)
<b>Electric or gas stove</b>	387 (33.9%)	265 (59.7%)	122 (17.5%)



## Results

- **1,143** adults were tested with the multiplex assay (Guatemala n=444, Honduras=699).
- The mean age was 54.2±14.5 years, 46.2% were male, 60% of individuals were from rural settings and 56% lived above 1000 meters over sea level.
- The most frequent occupations were domestic work and agriculture (40% and 19% respectively).
- No significant differences were noted according to country, age group, gender, or rural/urban location.
- Over half (53%) of individuals had a refrigerator, and 34% had an electric or gas stove.
- 44% and 16% were either current or former tobacco smokers in Guatemala and Honduras, respectively.
- 43% noted alcohol use.
- **Hp seropositivity was 87%, active infection was 83%.**
- **CagA and VacA seropositivity was 82% and 75% respectively.**

## Conclusions

- **An extremely high seroprevalence of Hp and CagA/VacA is observed in Honduras and Guatemala and is representative of Northern Central America.**
- **This correlates with the high burden of GC in the region, and has implications for regional prevention programs as well as immigrant populations in the U.S.**

## Contact

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