

National hepatitis B virus (HBV) screening pilot using rapid HBV antibody tests in Kazakhstan

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Introduction

Hepatitis B virus (HBV) infection remains a major public health challenge in Kazakhstan, affecting an estimated 443,000 individuals. Despite the availability of free testing and treatment, fewer than 17% of cases were diagnosed by 2024. Current screening programs target only high-risk groups, pregnant women, and surgical patients, leaving many undiagnosed. This gap undermines Kazakhstan's progress toward the World Health Organization's (WHO) 2030 elimination target.

Aim

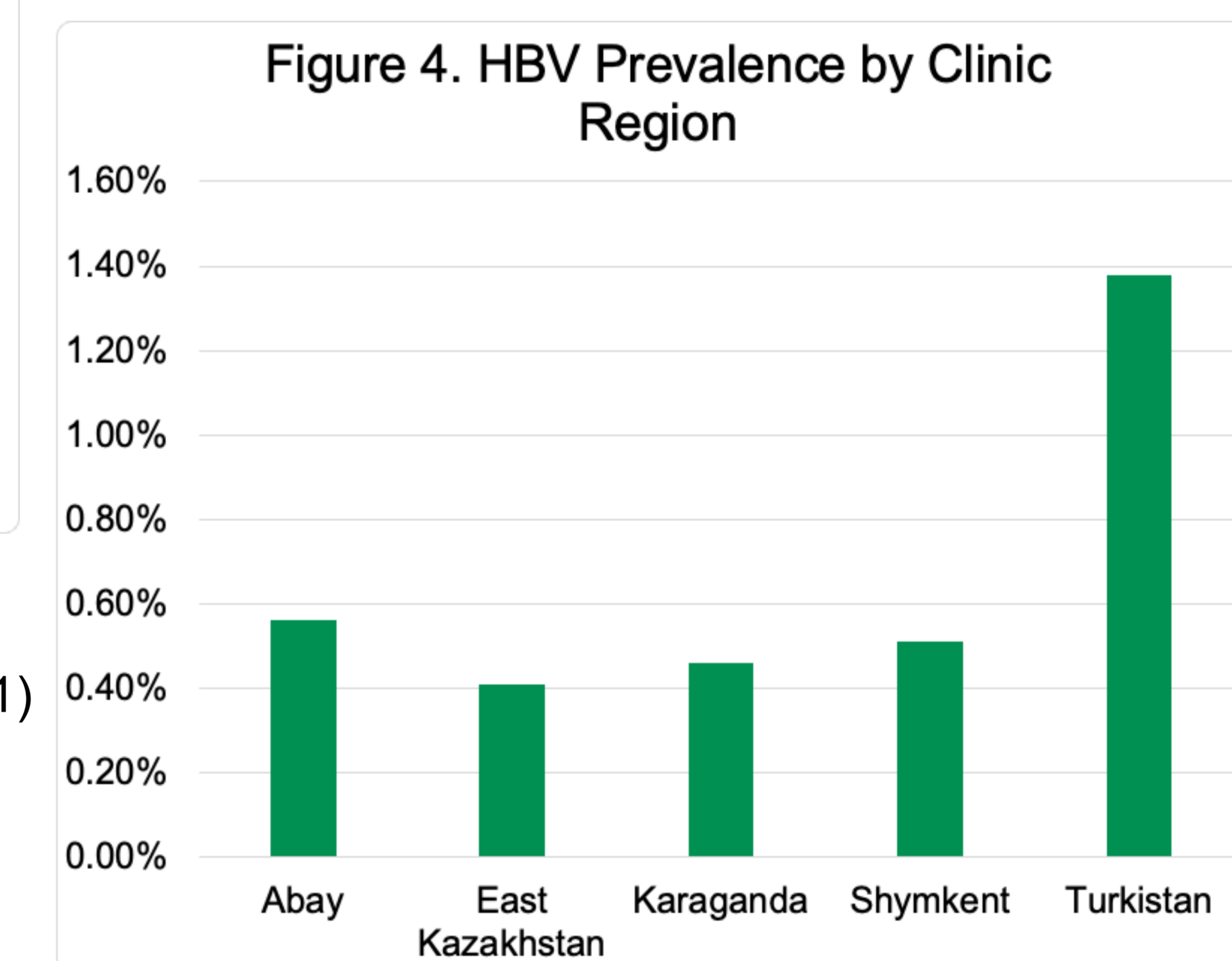
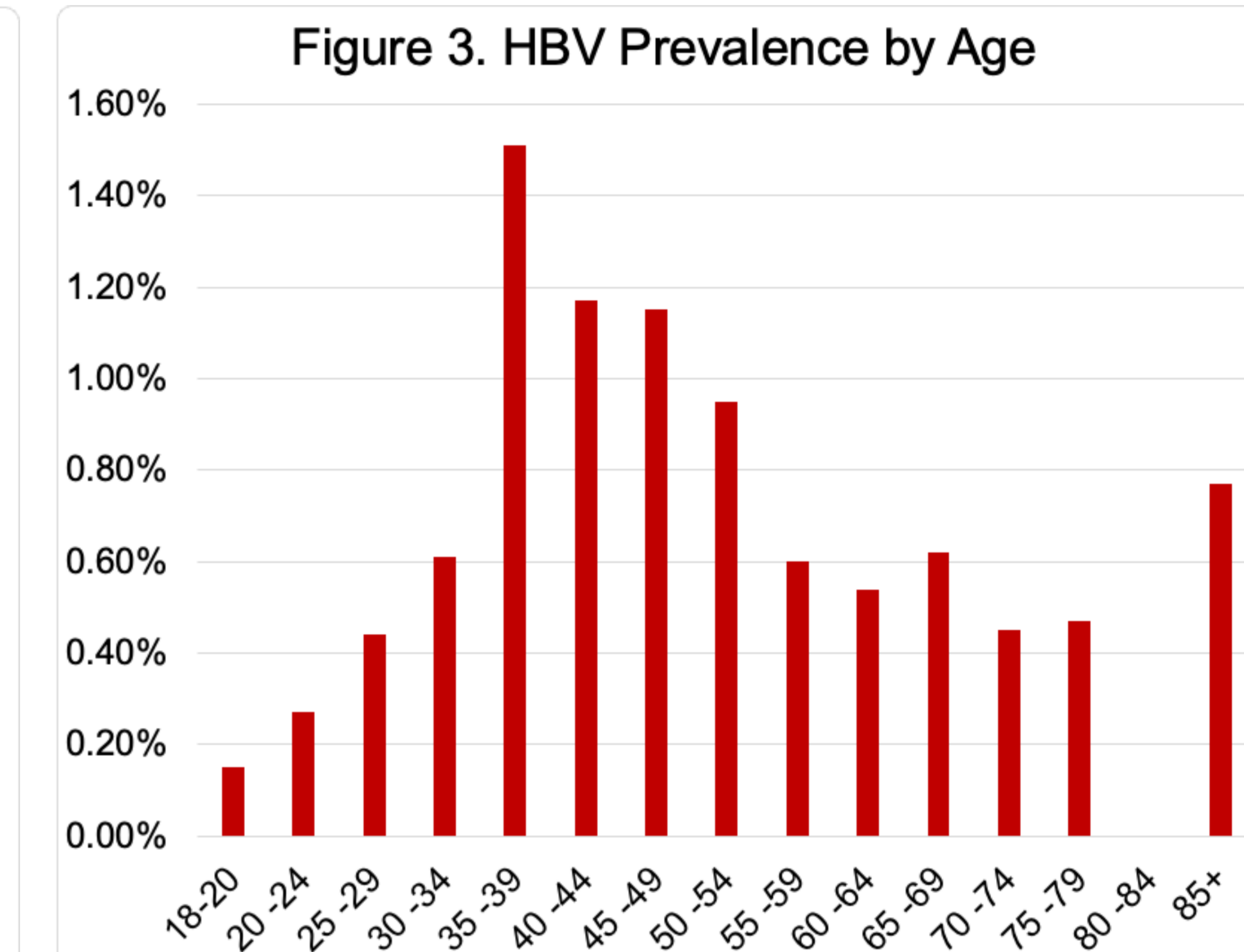
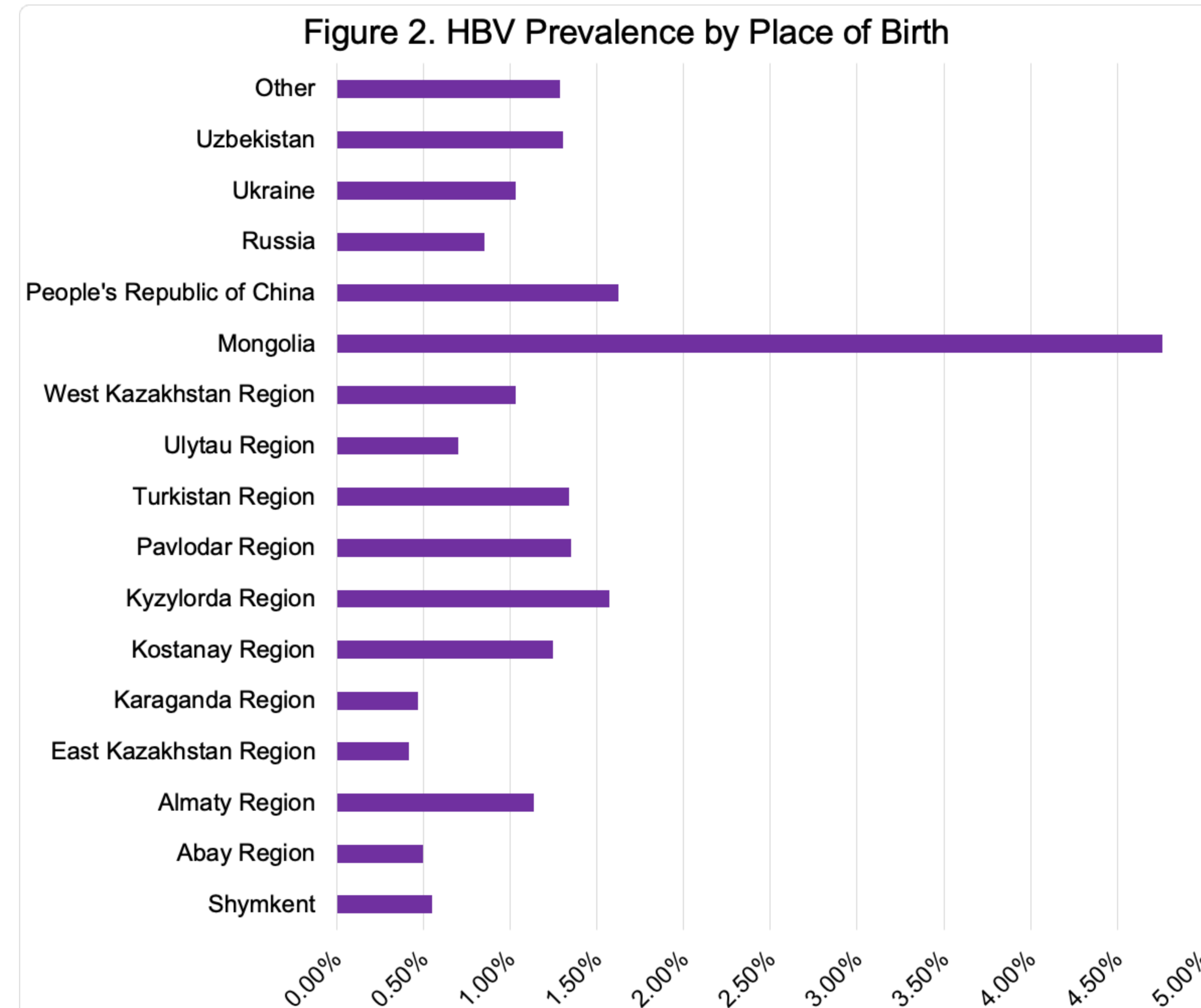
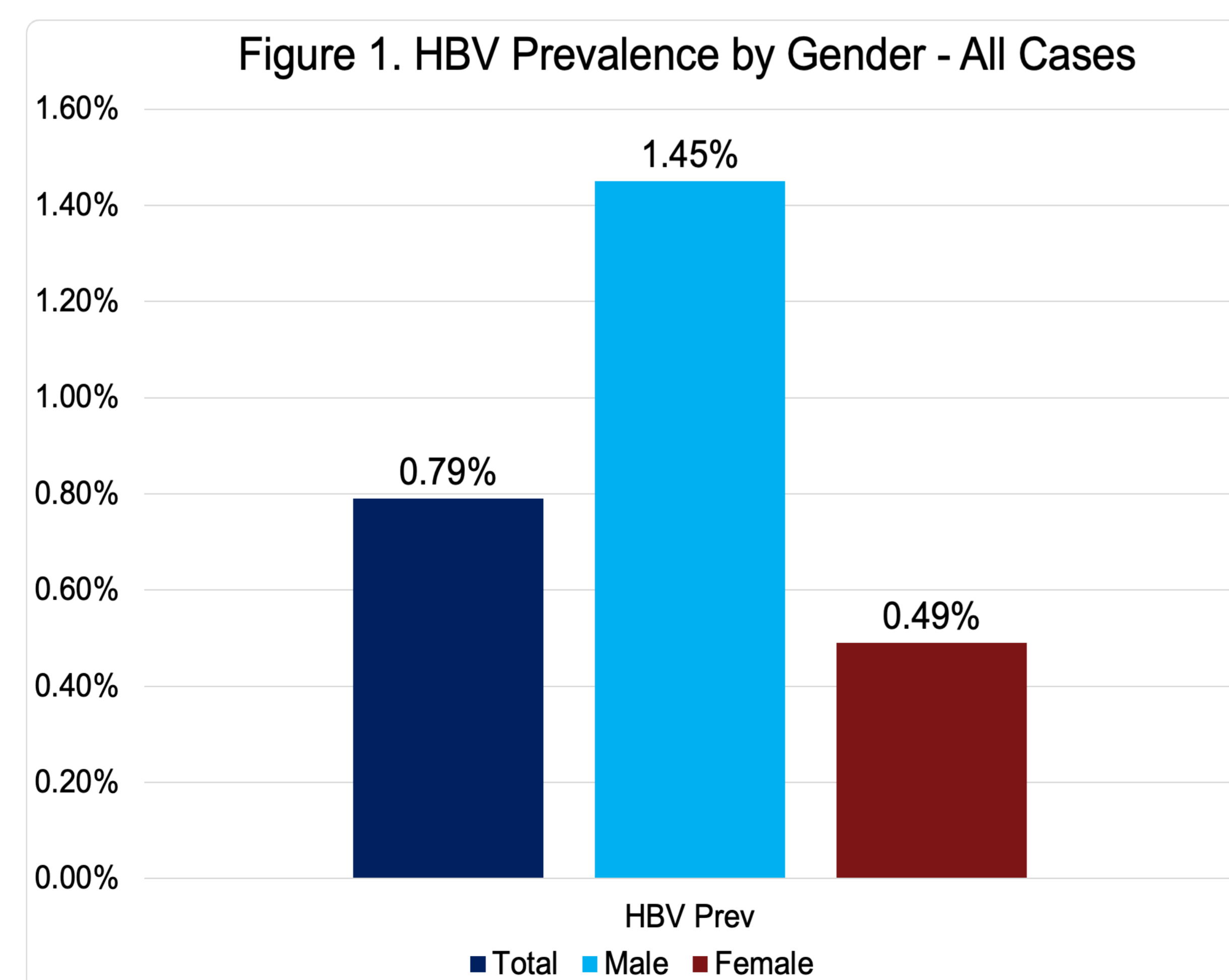
This pilot evaluated the effectiveness of large-scale adult population screening in urban and rural polyclinics. The findings aim to inform the development of a national program to improve diagnosis, treatment, and public health outcomes to meet WHO elimination goals.

Method

- **Study Population:** Adults attending polyclinics within five major regions of Kazakhstan: *East Kazakhstan, Abay, Turkistan, Karaganda, and Shymkent*
- **Sampling Method:** Convenience sampling
- **Screening:** 100,024 individuals tested for HBsAg antibodies using rapid diagnostic tests
- **Data Management:** Results recorded in an electronic registry
- **Prevalence Stratification:** Age, sex, birth region, and clinic region
- **Analysis Method:** Prevalence adjusted for age and sex, with Poisson regression used to identify significant predictors of HBV prevalence variability

Results

- Overall HBV Prevalence (Figure 1):
 - Adjusted for age and sex: 0.83% (0.55 – 0.65%)
- Prevalence by Sex (Figure 1):
 - Males: 1.45% (1.32 – 1.59%)
 - Females: 0.48% (0.44 – 0.55%)
- Prevalence by Age (Figure 3):
 - Peak prevalence at 1.51% (1.28-1.77%) in individuals aged 35 – 39
- Prevalence by region of birth (Figure 2):
 - Highest prevalence among those born in Mongolia, reaching 4.88% (1.60-12.56%)
- Prevalence by clinic region (Figure 4):
 - Clinics located in Turkistan had the highest prevalence at 1.38% (1.26– 1.51%)



- Regression Analyses:
 - Higher HBV rates found in individuals born outside of Kazakhstan ($p < 0.01$)
 - Younger age groups had significantly lower rates compared to those aged 35 – 39 ($p < 0.01$)

Conclusions

This pilot program demonstrated the feasibility of large-scale HBV screening and identified significant variability in prevalence by age, sex, and geography. Males, individuals aged 35-39, and those born outside Kazakhstan showed elevated prevalence, highlighting the need for targeted interventions. However, expanding the program to all regions and high-risk groups is critical for a comprehensive assessment of HBV prevalence. Development of a national screening strategy will be essential for Kazakhstan to meet WHO elimination targets and reduce the public health burden of HBV.

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