

Gaps in Measles and Mumps Seroprevalence Among Cancer Patients

Sara Marquis, MPH¹; Jennifer Logue, BS²; Tillie Loeffelholz, BS¹; ZZ Quinn, BS¹; Catherine Liu, MD^{1,2,3,5};
F Marc Stewart, MD^{4,5}; Helen Y Chu, MD, MPH²; Steven A Pergam, MD, MPH^{1,2,5,6}; Elizabeth M. Krantz, MS¹

¹Vaccine and Infectious Disease Division, Fred Hutchinson Cancer Research Center; ²Division of Allergy and Infectious Diseases, University of Washington; ³Antimicrobial Stewardship, Seattle Cancer Care Alliance; ⁴Division of Oncology, University of Washington; ⁵Clinical Research Division, Fred Hutchinson Cancer Research Center; ⁶Infection Prevention, Seattle Cancer Care Alliance

BACKGROUND

- Immunosuppressed cancer patients are at risk for life-threatening complications from vaccine preventable diseases
- Recent outbreaks and declining community immunity put cancer patients at increased risk for measles and mumps exposures

OBJECTIVES

- To determine the prevalence of protective measles and mumps antibodies in a large cohort of patients at a major cancer treatment center.
- To compare measles and mumps seroprevalence among demographic, disease and treatment subgroups

METHODS

Subject Population: Patients receiving routine bloodwork at Seattle Cancer Care Alliance over 5 days in August 2019 (n=1000)

Residual plasma samples

Measles and mumps IgG testing

Overall and subgroup measles and mumps seroprevalence¹ determined

Demographic and clinical data from EMR

¹Seroprevalence was defined as the proportion of patients with positive antibody results. Equivocal antibody results were not considered protective.

RESULTS

Table 1. Baseline demographics and clinical characteristics (n=1000)

Characteristics		
Age in years, median (range)		61 (2 - 97)
Age group (in years)	<18	12 (1%)
	18-29	38 (4%)
	30-39	71 (7%)
	40-49	108 (11%)
	50-59	227 (23%)
	60-69	288 (29%)
	70-79	197 (20%)
	80+	59 (6%)
Male, n (%)		531 (53%)
Primary Disease	Solid Tumor	575 (58%)
	Hematologic Malignancy	383 (38%)
	Other	42 (4%)
HCT history		158 (16%)
Prior IVIG		46 (5%)
Chemotherapy within 30 days		315 (32%)

Figure 1. Distribution of age at sample collection and measles antibody results

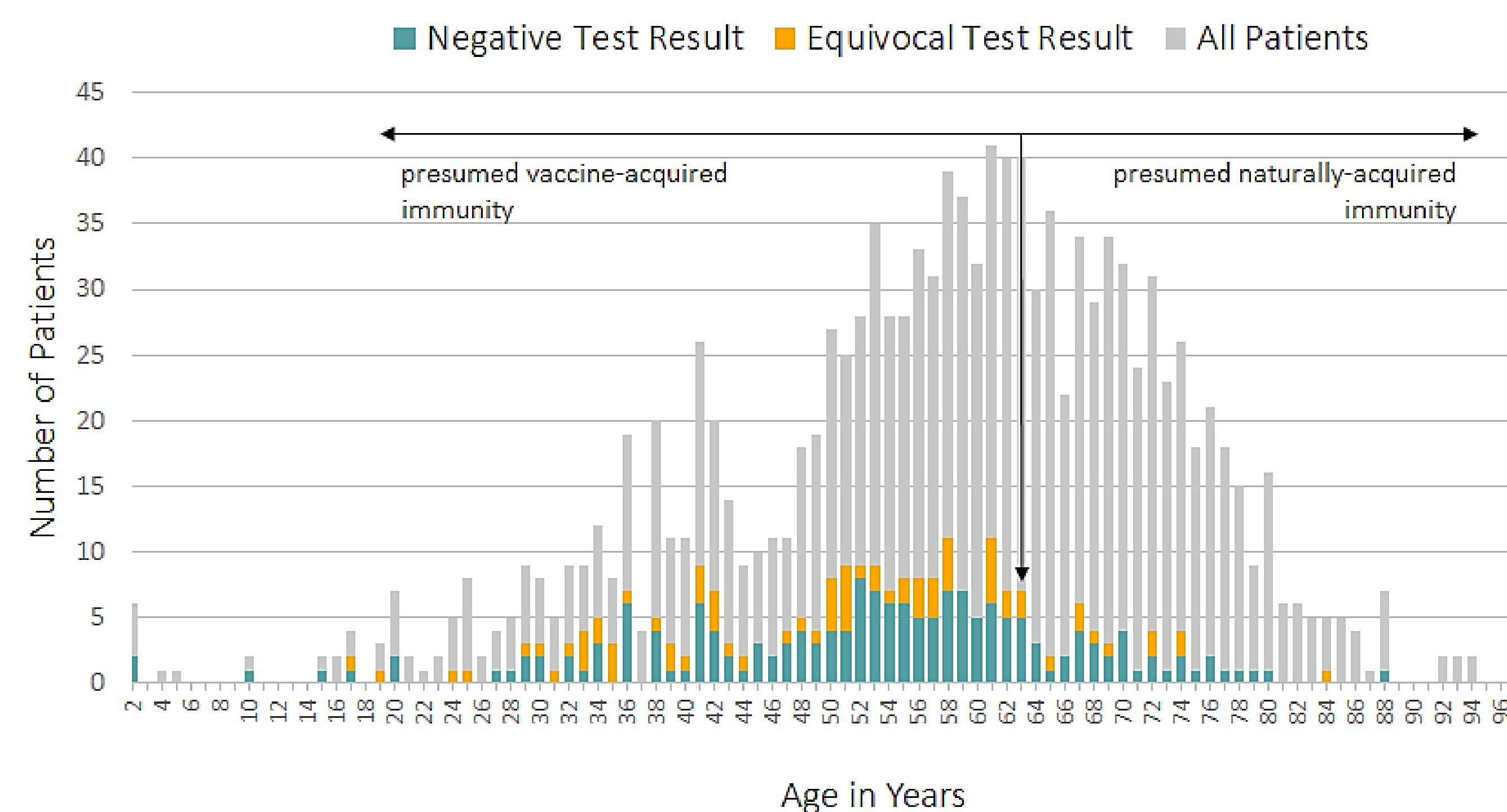


Figure 2. Prevalence of measles and mumps seroprevalence estimates by subgroup

Fig 2a. Overall seroprevalence

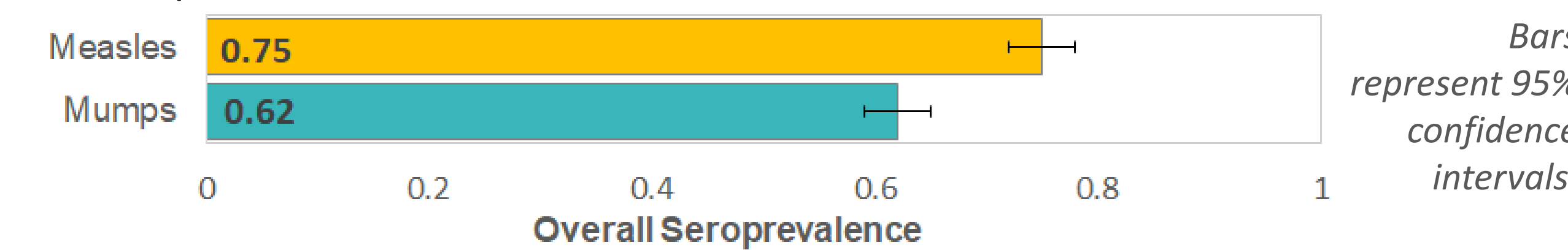


Fig 2b. Seroprevalence by age group

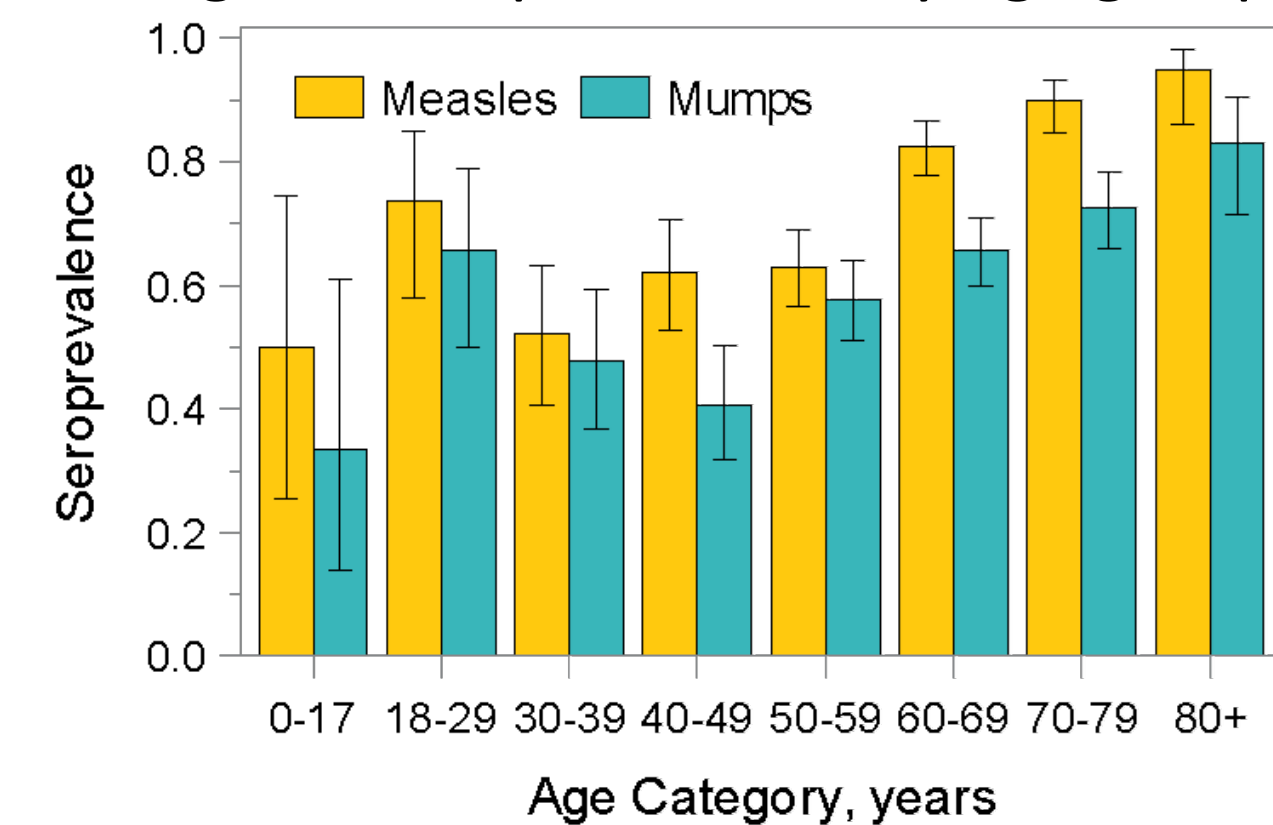


Fig 2c. Seroprevalence by sex

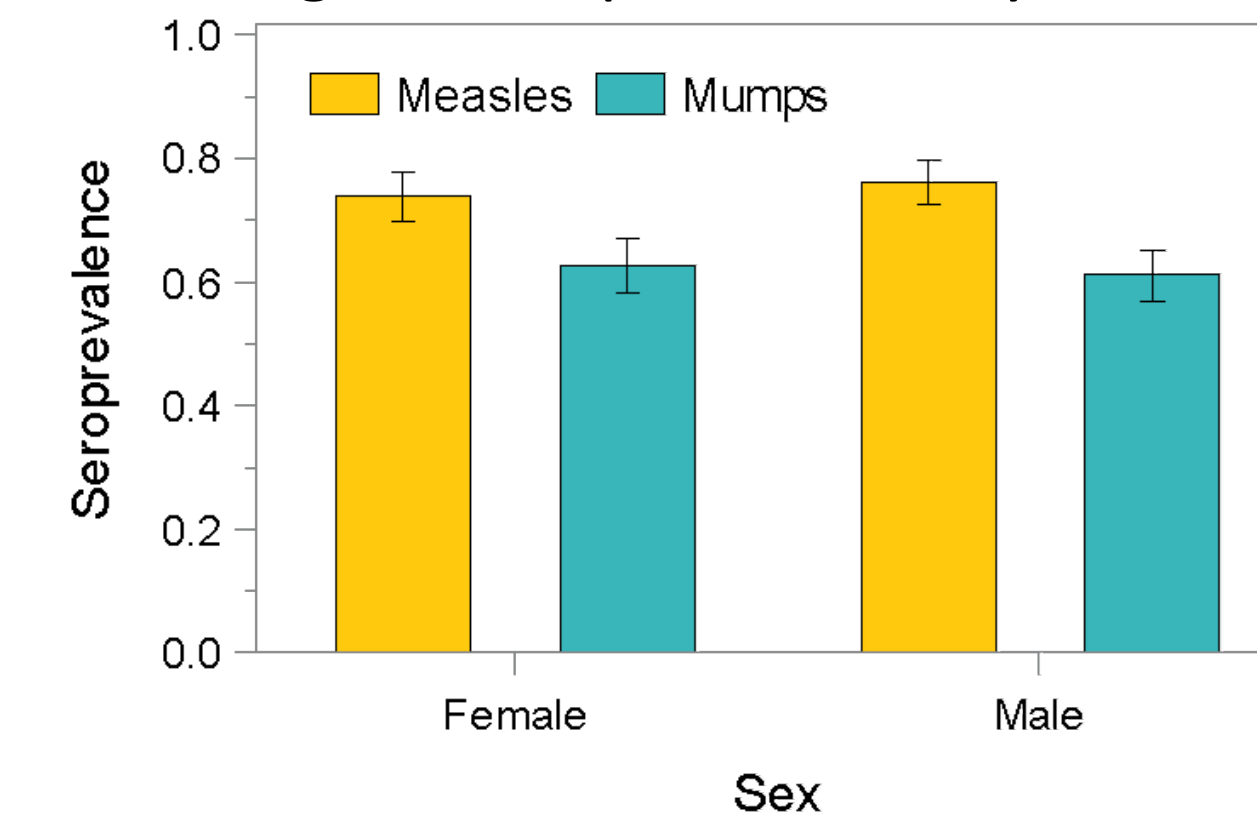


Fig 2d. Seroprevalence by primary disease

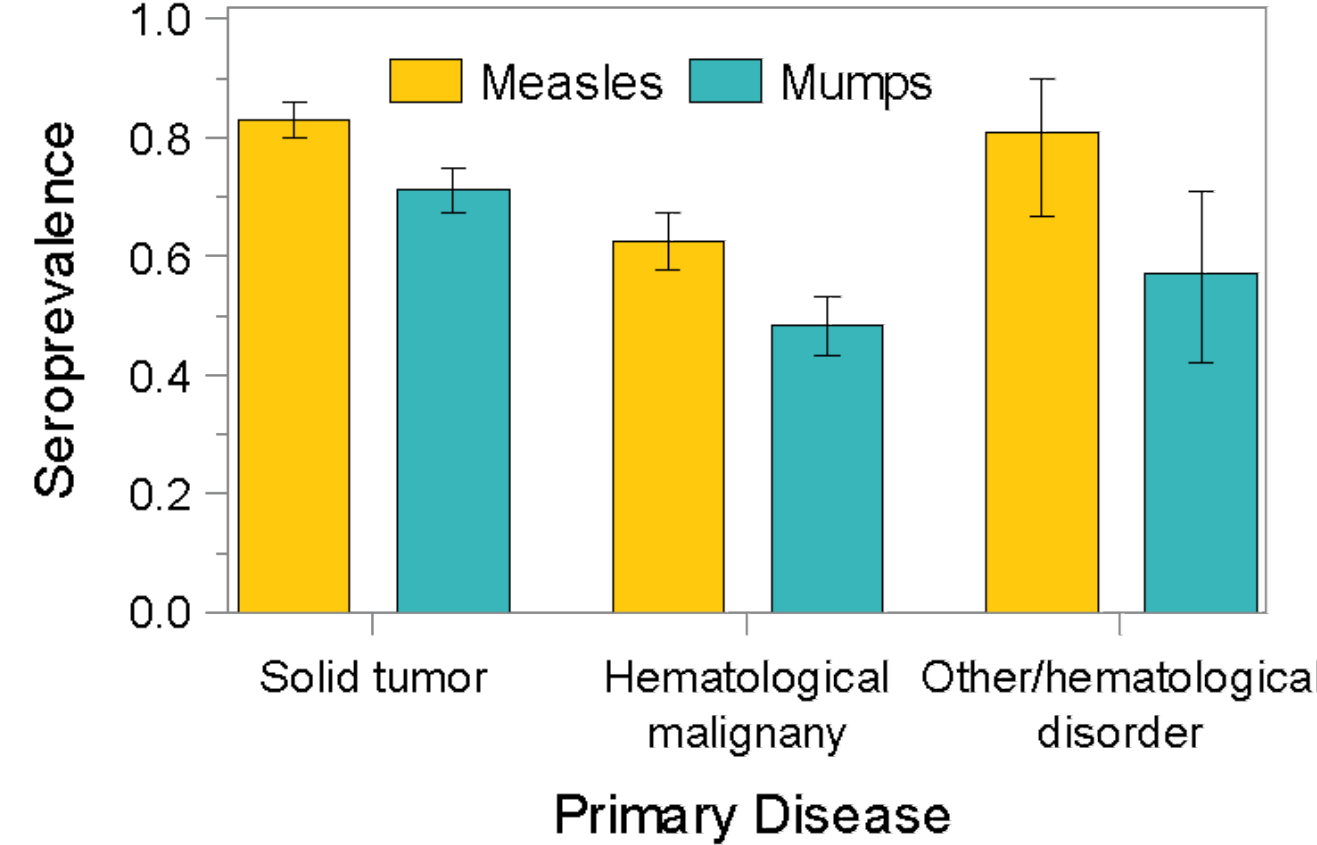


Fig 2e. Seroprevalence by HCT history

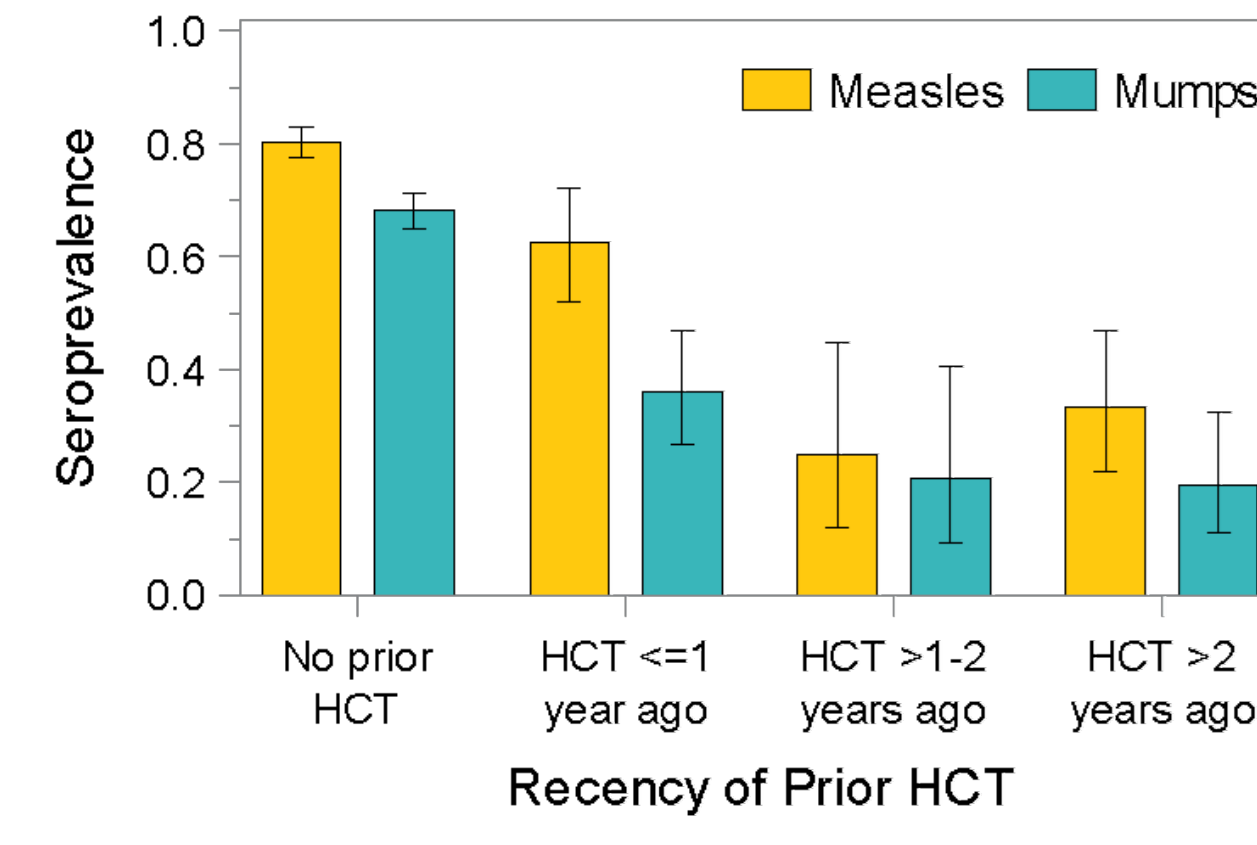


Fig 2f. Seroprevalence by chemotherapy

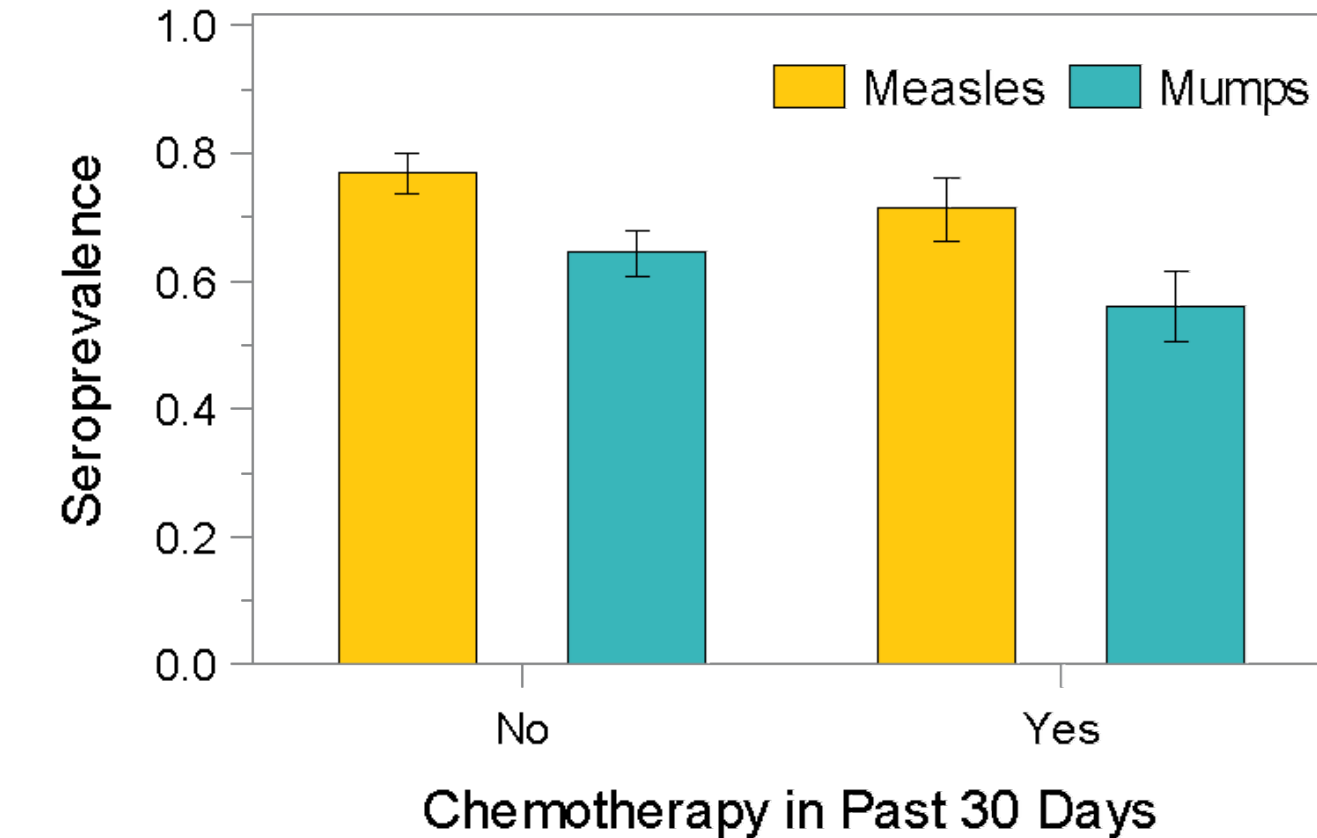


Fig 2g. Seroprevalence by IVIG

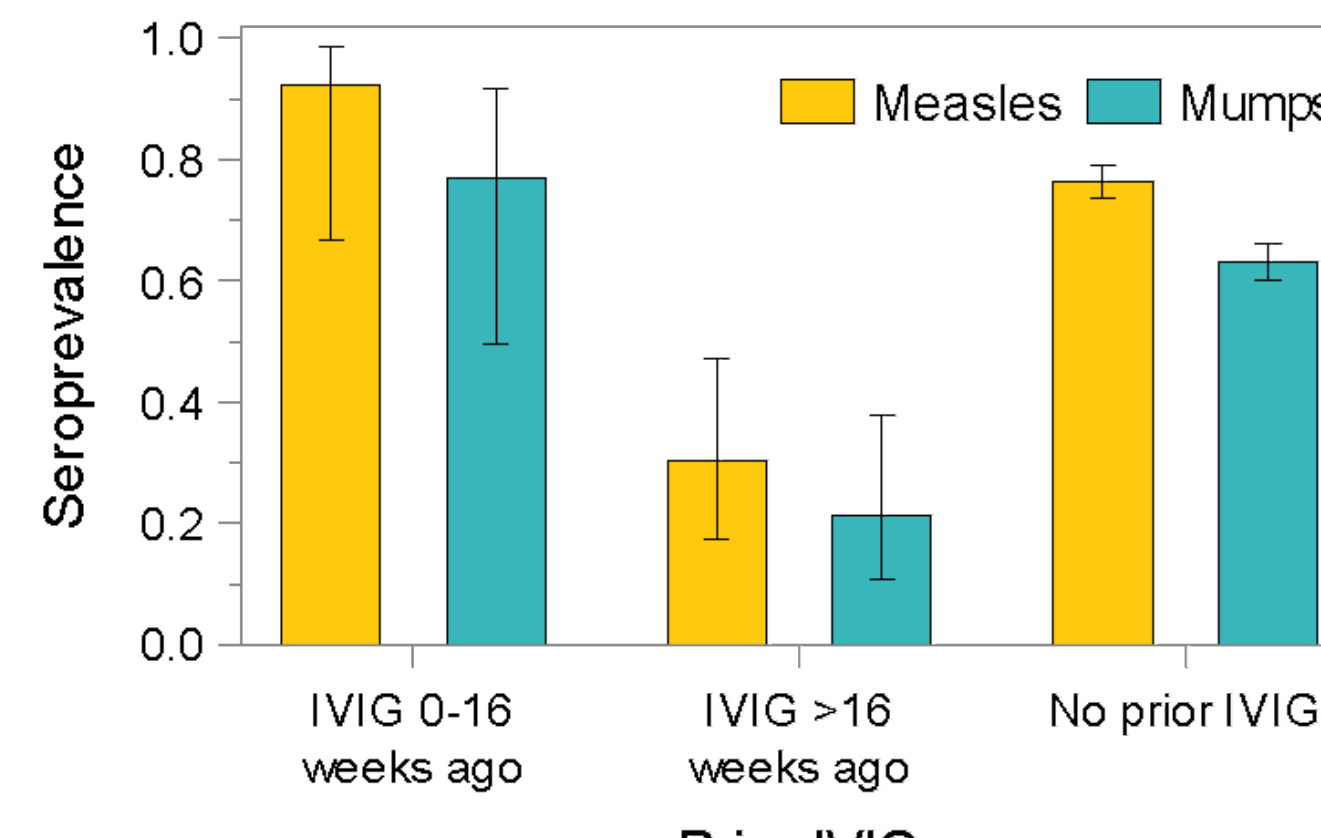
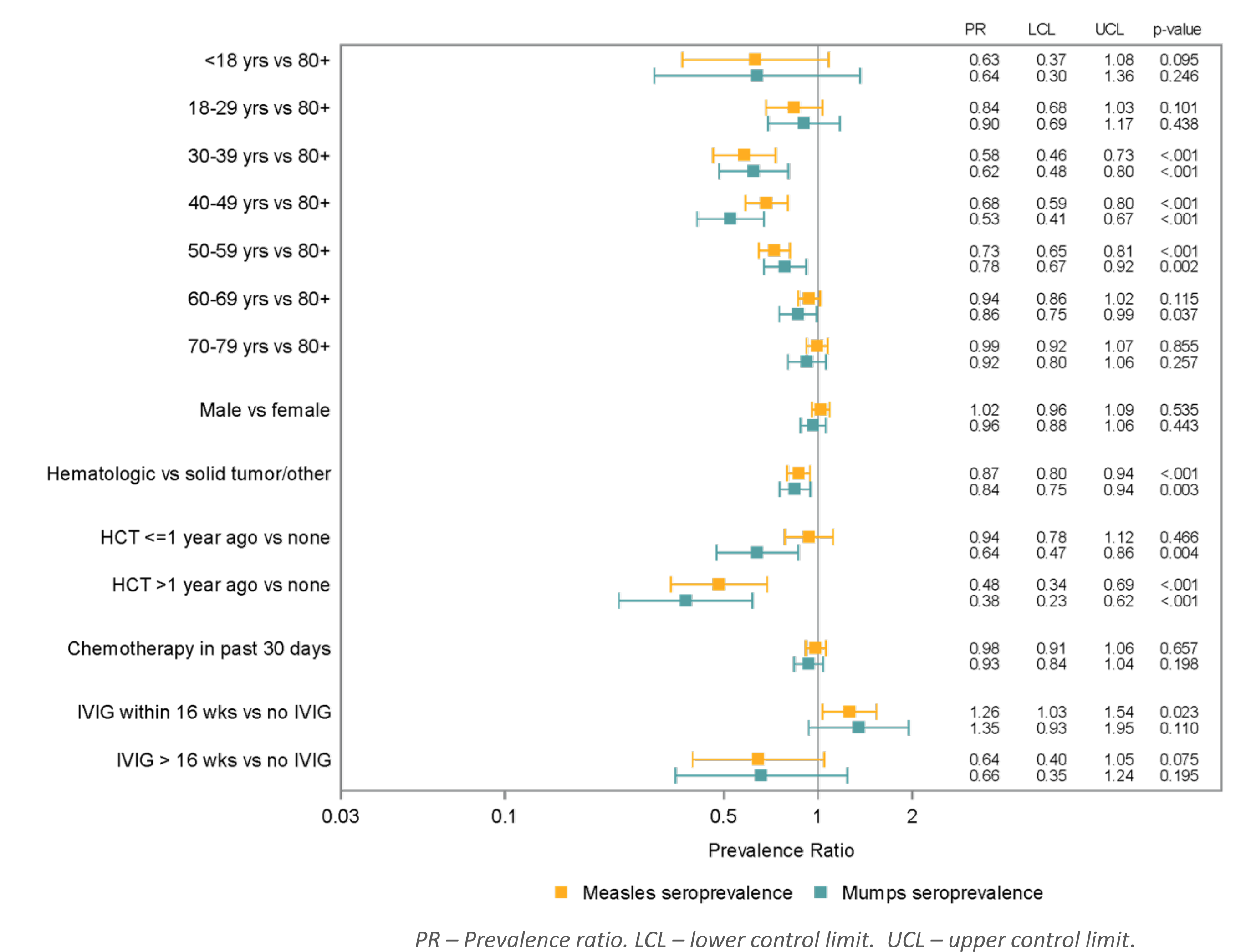


Figure 3. Forest plot of multivariable model estimates for prevalence of measles and mumps seroprevalence

Poisson regression with robust standard errors was used to obtain model estimates, which are adjusted for variables shown.



CONCLUSIONS

- One-quarter of cancer patients tested did not have evidence of seroprotection for measles and mumps
- Seronegative/equivocal responses were observed among younger patients and those with hematologic malignancies, including hematopoietic cell transplant recipients
- Our data underscore the need for stronger state/national vaccine policies which aim to improve herd immunity in order to protect vulnerable populations