Supplementary Table 1. Sensitivity analyses of the PIV association				
Analysis	**n**	**Positive n**	**Adjusted OR per doubling (95% CI)**	**Wald p**
Common ages	783	246	0.746 (0.672-0.828)	<0.001
Additional sex adjustment	783	246	0.746 (0.672-0.828)	<0.001
Age <10 years	793	256	0.761 (0.687-0.843)	<0.001
Exclude upper 1% PIV	775	246	0.750 (0.675-0.833)	<0.001
Exclude dual A+B positivity	777	240	0.742 (0.668-0.825)	<0.001

All models adjust for age and $\log_2$(CRP) using restricted cubic splines and express PIV per doubling. Splines are re-estimated within each sensitivity sample. Except for the <10-year analysis, samples are based on common ages (2.25-9.9167 years). Additional sex adjustment retains the 783-child common-age sample. All analyses are exploratory.
OR: Odds ratio, CI: Confidence interval, PIV: Pan-immune-inflammation value, CRP: C-reactive protein

Supplementary Table 2. Single index ROC analyses and exploratory thresholds						
Sample	**Index**	**AUC (95% CI)**	**p vs. 0.5**	**Threshold**	**Sens. %**	**Spec. %**
Full sample	SII	0.575 (0.537-0.612)	<0.001	≤602.147	63.4	56.4
Full sample	SIRI	0.619 (0.582-0.656)	<0.001	≤1.883	62.0	62.0
Full sample	PIV	0.648 (0.612-0.684)	<0.001	≤413.732	60.9	67.8
Common ages	SII	0.607 (0.565-0.648)	<0.001	—	—	—
Common ages	SIRI	0.643 (0.602-0.685)	<0.001	—	—	—
Common ages	PIV	0.662 (0.622-0.703)	<0.001	—	—	—

Full sample: n=903, 366 positive. Common ages: n=783, 246 positive, age 2.25-9.9167 years. Lower values indicate influenza positivity. AUC confidence intervals use non-parametric DeLong variance. Full-sample thresholds maximize the Youden index in the same data and are exploratory. Values are rounded for display; sensitivity and specificity use the unrounded thresholds. No threshold was separately optimized in the common-age sample, indicated by —. Numerical cell counts used in indices are in 10^3/μL.
ROC: Receiver operating characteristic, AUC: Area under the curve, CI: Confidence interval, Sens.: Sensitivity, Spec.: Specificity, SII: Systemic immune-inflammation index, SIRI: Systemic inflammation response index, PIV: Pan-immune-inflammation value

Supplementary Model Specification

The exploratory common-age model uses the logit of influenza positivity, with age in years, CRP in mg/L before $\log_2$ transformation, and PIV derived from numerical cell counts in 10^3/μL. Age knots are 3.00000000, 5.08333333, 7.25000000, and 9.33333333. $\log_2$(CRP) knots are −1.00000000, 1.48542683, 4.10247505, and 6.58721319.

For four ordered knots $t_1,\ldots,t_4$, the two non-linear basis functions, for j=1,2, are:

$$h_j(x)=[(x-t_j)_+^3-(x-t_3)_+^3(t_4-t_j)/(t_4-t_3)+(x-t_4)_+^3(t_3-t_j)/(t_4-t_3)]/(t_4-t_1)^2,$$

where $z_+=\max(z,0)$. Each spline includes its linear term x and $h_1(x)$, $h_2(x)$.

Coefficients (B; standard error)

Term	B	Standard error
Intercept	−0.04867610	0.89206447
Age	0.51651503	0.20301796
Age h_1	−0.64915461	0.62661724
Age h_2	0.92257591	1.76456437
$\log_2$(CRP)	0.47158911	0.14857393
$\log_2$(CRP) h_1	−1.73690929	0.51884397
$\log_2$(CRP) h_2	3.95598064	1.53456019
$\log_2$(PIV)	−0.29277401	0.05320195

Spline coefficients are basis-specific and are not individually interpretable as constant clinical odds ratios. This specification supports reproduction of the exploratory fitted model; it is not a validated clinical risk calculator.
CRP: C-reactive protein, PIV: Pan-immune-inflammation value

Term-level GVIF (df; adjusted GVIF)

Term	GVIF	df	Adjusted GVIF
Age	1.132	3	1.021
log2_CRP	1.174	3	1.027
log2_PIV	1.176	1	1.085

GVIF: Generalized variance inflation factor, df: Term degrees of freedom. Adjusted GVIF: GVIF^(1/[2×df])