Research Letter

Did the 2026-2027 Influenza Season Begin Before South Korea's National Vaccination Program? Evidence From Sentinel Surveillance

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Abstract

This study aimed to examine the onset of the 2026-2027 influenza season in South Korea by comparing sentinel surveillance data from its first week with data from seven earlier seasons. Influenza-like illness exceeded the epidemic threshold in the week beginning August 30, 2026, with the increase predominantly driven by the A(H1N1)pdm09 strain and most pronounced in children aged 1 to 12 years relative to historical patterns. This occurred approximately 5 to 8 weeks before the national vaccination program could first confer protection.

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Keywords: influenza; South Korea; sentinel surveillance; epidemic onset; vaccination timing; school-aged children; reproduction number

Introduction

In temperate countries, influenza vaccination programs typically begin in September or October, before seasonal activity rises. Influenza seasonality has shifted since the COVID-19 pandemic [1]. Whether influenza season onset precedes vaccination in South Korea remains unquantified.

In week 36 of 2026, influenza-like illness (ILI) exceeded the epidemic threshold. A national epidemic advisory followed on September 11, 2026 [2], and the national immunization program began on September 21, 2026 [3]. This study quantified the epidemic magnitude, subtype composition, age distribution, growth rate, and interval between onset and expected vaccine-induced protection.

Methods

Ethical Considerations

This study analyzed published aggregate surveillance statistics, without intervention, participant interaction, or identifiable information. Under Article 2 of the Enforcement Rule of the Korean Bioethics and Safety Act, it did not constitute human subject research; informed consent was thus not applicable.

Data Sources

The analysis used national sentinel surveillance data published by the Korea Disease Control and Prevention Agency (KDCA). Age-stratified weekly ILI rates for 2016-2017 through 2026-2027 were obtained from the KDCA Infectious Disease Portal [2]. ILI was measured per 1000 outpatients; each season spanned week 36 to week 35. Weekly influenza positivity and subtype composition, influenza hospitalizations, and severe acute respira-

tory infection (SARI) positivity were extracted from weekly reports of the Korea Sentinel Surveillance [2].

The 2016-2017 season was excluded because of incomplete data. Additionally, the 2020-2021 and 2021-2022 seasons were excluded from historical comparisons owing to pandemic control measures. Because the ILI sentinel network expanded from 294 to 778 clinics, age-specific ILI was expressed relative to all-age ILI in the same week to reduce the influence of changes in network size.

Analysis

Influenza-specific ILI (ILI+) was calculated as the ILI rate multiplied by weekly influenza positivity [4], and exponential growth was estimated using log-linear regression over weeks 31-35 of 2026 (Multimedia Appendix 1). The growth rate was converted to a reproduction number, assuming a gamma-distributed generation time (mean 3.2, SD 2.1 days) [5,6]. Vaccine protection was assumed to begin 14 days after each group's vaccination start date [3]. The analyses were performed using R (version 4.3.3; R Foundation for Statistical Computing).

Results

In week 36, all-age ILI was 25.3 per 1000 outpatients, exceeding the epidemic threshold of 12.9 and representing 5.2 times the median across the 7 comparison seasons (Table 1). Among children aged 7 to 12 years, ILI reached 75.1, representing 11.9 times the historical median and 3 times the previous week 36 maximum (25.3 in 2023-2024; Table 1 and Figure 1A). Fold differences in the other age groups ranged from 3.4 to 8.3. Relative to all-age ILI, week 36 ratios among children aged 1 to 6 and 7 to 12 years (1.97 and 2.97, respectively) exceeded their historical ranges (0.77-1.73 and 1.12-2.24, respectively), whereas the ratio among adults aged ≥65 years (0.35) was within its historical range (0.26-0.71). Ratios among adults aged 19 to 49 and 50 to 64 years (0.93 and 0.47, respectively) fell below their historical ranges (0.97-1.23 and 0.50-0.84, respectively).

Table 1. Influenza-like illness (ILI) per 1000 outpatients in week 36, the first week of the surveillance season, by age group: the 2026-2027 season compared with 7 earlier seasons (2017-2018, 2018-2019, 2019-2020, 2022-2023, 2023-2024, 2024-2025, and 2025-2026). Seasons affected by COVID-19 control measures (2020-2021 and 2021-2022) are excluded.

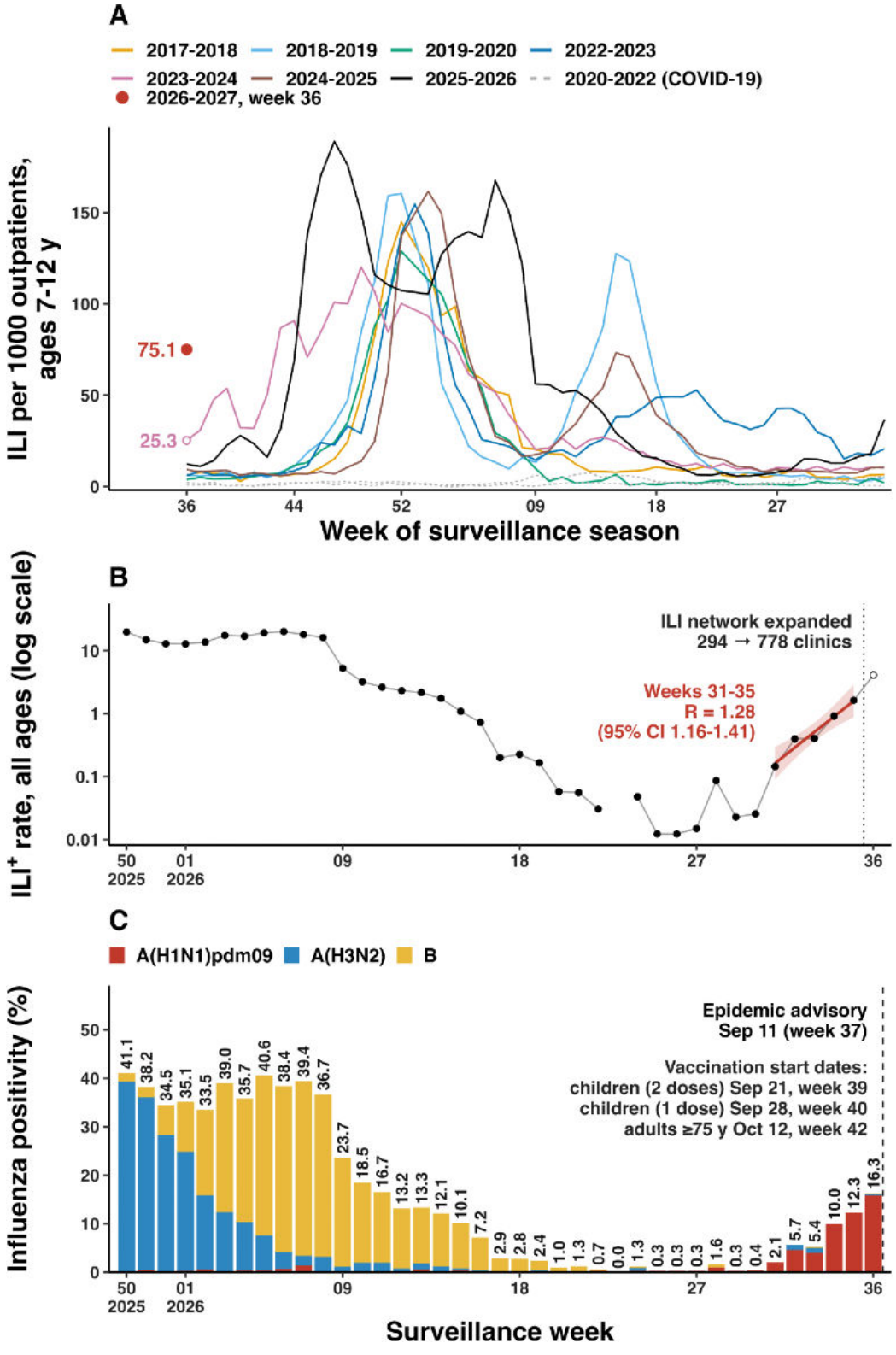
Age group (y)	ILI, 2026-2027, week 36	ILI, historical median, week 36	ILI, historical maximum[a] (season)	Fold difference	Relative ratio[b], 2026-2027	Relative ratio[b], historical range
All ages	25.3	4.9	11.3 (2023-2024)	5.2	N/A[c]	N/A
<1	24.0	2.9	13.4 (2024-2025)	8.3	0.95	0.21-2.20
1-6	49.8	6.7	12.9 (2023-2024)	7.4	1.97	0.77-1.73
7-12	75.1	6.3	25.3 (2023-2024)	11.9	2.97	1.12-2.24
13-18	31.3	8.5	13.6 (2023-2024)	3.7	1.24	1.00-1.81
19-49	23.5	5.7	11.0 (2023-2024)	4.1	0.93	0.97-1.23
50-64	11.8	3.5	6.7 (2023-2024)	3.4	0.47	0.50-0.84
≥65	8.8	2.1	4.7 (2023-2024)	4.2	0.35	0.26-0.71

[a]The historical maximum is the highest value recorded in week 36 of any of the 7 comparison seasons, with that season shown in parentheses.
[b]The relative ratio is age-specific ILI divided by all-age ILI in the same week; this measure is insensitive to variations in the number of participating ILI sentinel clinics.
[c]N/A: not applicable.

Four surveillance streams whose sizes remained unchanged showed the same increase in influenza activity (Multimedia Appendix 1). Between weeks 31 and 36, influenza positivity increased from 2.1% to 16.3% in the Korea Respiratory Virus Integrated Surveillance System (K-RISS) data and from 3.0% to 13.3% in commercial laboratories. In week 36 of 2025, the corresponding values for K-RISS and commercial laboratories were 2.3% and 1.0%, respectively. Influenza-related admissions in the inpatient network increased from 38 in week 31 to 300 in week 36, compared with 23 in week 36 of 2025. In week 36, 50 of the 245 newly admitted patients with SARI tested positive (20.4%).

ILI+ grew at a rate of 0.081 per day over weeks 31-35 (doubling time 8.5 days; Figure 1B), corresponding to a window-averaged effective reproduction number of 1.28 (95% CI 1.16-1.41). Estimates ranged from 1.24 to 1.33 across the generation time assumptions and from 1.28 to 1.38 across the alternative fitting windows (Multimedia Appendix 1).

Figure 1. (A) Influenza-like illness (ILI) per 1000 outpatients among children aged 7 to 12 years, by week of the surveillance season, from 2017-2018 through 2026-2027. Colored lines represent individual comparison seasons, and dotted gray lines show the COVID-19–affected 2020-2021 and 2021-2022 seasons. The filled red circle marks week 36 of 2026-2027, and the open circle marks week 36 of 2023-2024, the previous maximum. (B) Influenza-specific ILI (ILI+; the all-age ILI rate multiplied by influenza positivity) on a log scale, from week 50 of 2025 through week 36 of 2026. The red line and shaded band show the log-linear fit and its 95% CI, respectively, over weeks 31-35. The open circle marks week 36, after the ILI sentinel network expanded from 294 to 778 clinics (dotted line). *R* denotes the window-averaged effective reproduction number over weeks 31-35, assuming an intrinsic generation time with a mean of 3.2 (SD 2.1) days. (C) Influenza positivity and subtype composition among Korea Respiratory Virus Integrated Surveillance System (K-RISS) specimens from individuals of all ages, from week 50 of 2025 through week 36 of 2026. The data show the A(H3N2) and B waves of the 2025-2026 season and the subsequent increase attributable almost entirely to A(H1N1)pdm09. The dashed line marks the national epidemic advisory (September 11, 2026), and the vaccination program start dates with their surveillance weeks are annotated. The start dates reflect those published before the season; subsequent adjustments are described in the Discussion.



The 2025-2026 season was driven by A(H3N2), followed by B. A(H1N1)pdm09 accounted for no more than 1.4% of all specimens tested before week 31 of 2026. The subsequent increase was almost entirely attributable to A(H1N1)pdm09, which accounted for 98% of influenza detections in week 36 (15.9% of the 16.3% positivity; Figure 1C).

The epidemic exceeded the threshold in the week beginning August 30, 2026. Under the preseason schedule, protection was first expected on October 5 for children requiring 2 doses, October 12 for children requiring 1 dose, and October 26 for adults aged ≥75 years—36, 43, and 57 days after the threshold was exceeded, respectively, equivalent to 4.2, 5.0, and 6.7 doublings of ILI+ at the observed growth rate (doubling time 8.5 days).

Discussion

At the first observation of the 2026-2027 season, ILI exceeded the epidemic threshold, driven by A(H1N1)pdm09 and disproportionately affecting primary school–aged children. Influenza-specific ILI grew rapidly (doubling time 8.5 days; window-averaged effective reproduction number 1.28), while vaccine-induced protection remained 5 to 8 weeks away under the preseason schedule.

A(H1N1)pdm09 accounted for only 6.0% of specimens in 2024-2025 [7], suggesting limited recent exposure to this subtype among school-aged children. School reopening could also have facilitated transmission [8]. Early onset was not unprecedented: the 2023-2024 season also began above its epidemic threshold, and influenza seasonality has shifted following the relaxation of pandemic control measures [1]. In response to the early epidemic, the KDCA advanced the start of single-dose vaccination for children by 1 week and vaccination for adults aged ≥65 years by 3 to 6 days [9].

This study has several limitations. ILI was measured per outpatient, and the expanded sentinel network may have altered the composition of participating clinics. Therefore, growth was estimated before the expansion, and age-specific ratios and unchanged laboratory and hospital networks were used for comparison. The unavailability of age-specific positivity data precluded age-specific reproduction number estimates. The reproduction number represents a fitting-window average, not a week-specific estimate. Surveillance data remain provisional.

Fixed vaccination schedules may leave populations unprotected during early epidemic growth, whereas advancing vaccination may increase the risk of waning immunity later in the season [10]. Surveillance-triggered, age-specific vaccination schedules warrant evaluation across multiple seasons to balance these competing risks.

Generative AI Use

The authors declare that generative AI was used in the creation of this manuscript. Generative AI (ChatGPT) was used for proofreading, editing, or language polishing. The authors verified all outputs of the tool(s) used in the preparation of this manuscript and take full responsibility for the final content of the manuscript.

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Data Availability

All data analyzed in this study were published by the Korea Disease Control and Prevention Agency in openly accessible weekly reports [2] and an online portal, and they are available for public reuse under the Korea Open Government License. The vaccination schedule used to derive the intervals to expected protection is published in [3]. Supplementary methods and tables are provided in Multimedia Appendix 1, and the compiled datasets are provided in Multimedia Appendices 2 and 3.

Authors' Contributions

ES is the sole author and is responsible for conceptualization, data curation, formal analysis, methodology, visualization, writing–original draft, and writing–review & editing.

Conflicts of Interest

ES reports receiving research support from CSL Seqirus Korea, outside the submitted work.

Multimedia Appendix 1

Supplementary methods: Sentinel network sizes according to surveillance stream and season, sensitivity analyses for growth rate and reproduction number, and selected weekly influenza positivity values.
[DOCX File (Microsoft Word File), 36 KB-Multimedia Appendix 1]

Multimedia Appendix 2

Weekly influenza-like illness rates by surveillance season and age group, obtained from Korea Disease Control and Prevention Agency sentinel surveillance, spanning from 2016-2017 through 2026-2027.
[XLS File (Microsoft Excel File), 323 KB-Multimedia Appendix 2]

Multimedia Appendix 3

Weekly influenza positivity and subtype composition among sentinel clinic specimens, spanning from week 50 of 2025 through week 36 of 2026.
[XLS File (Microsoft Excel File), 9 KB-Multimedia Appendix 3]

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Abbreviations

ILI: influenza-like illness
ILI+: all-age ILI rate multiplied by influenza positivity
K-RISS: Korea Respiratory Virus Integrated Surveillance System
KDCA: Korea Disease Control and Prevention Agency
SARI: severe acute respiratory infection

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