

Hurricanes Have Minimal Influence on Sinus Infection Rates

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Key Findings:

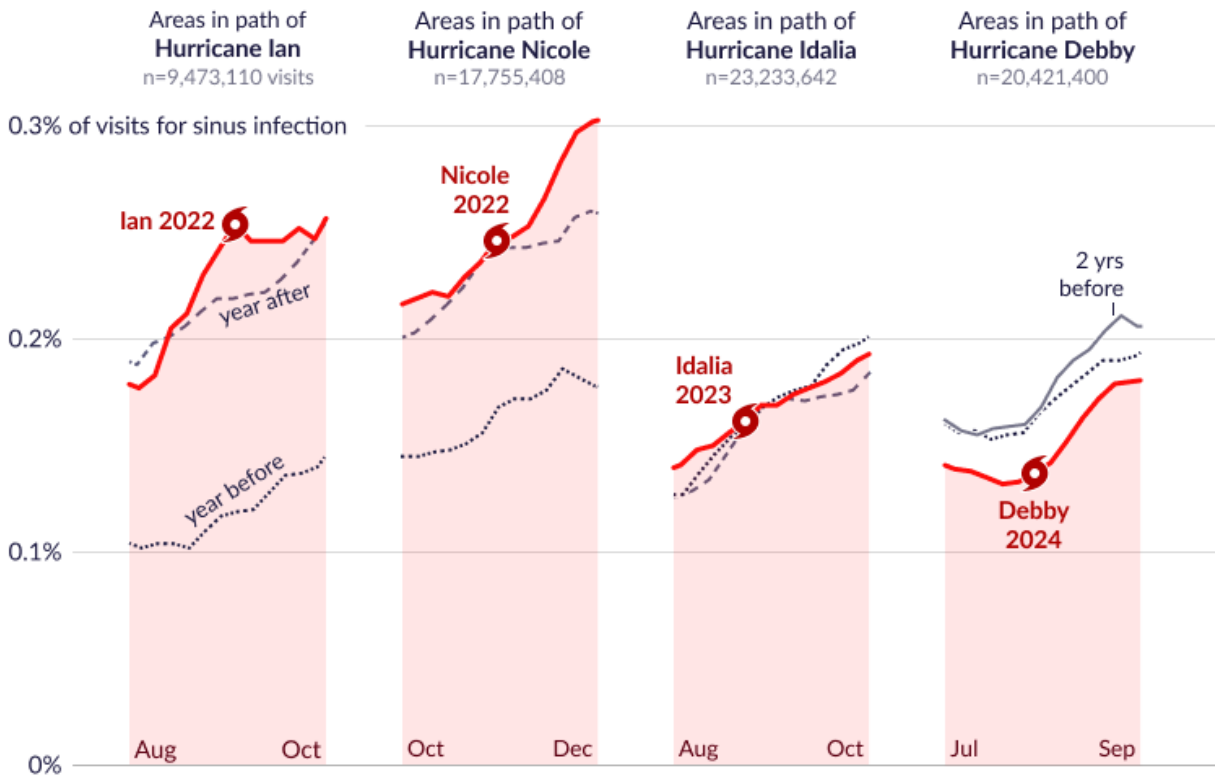
- Sinus infection rates in areas where hurricanes made landfall show minor fluctuations, but no consistent trends, in the six weeks following the storms, compared to equivalent time periods in previous and subsequent years.
- Hurricanes are most likely to make landfall during the same months that are typically associated with respiratory illness; that seasonality likely plays a much larger role in sinus infection rates.

Hurricanes have been associated with a range of public health concerns, including respiratory illnesses due to mold exposure, infrastructure damage limiting healthcare access, and increased stress-related conditions.^{1,2} Previous studies have looked at increases in respiratory symptoms following specific hurricanes, but the overall impact of hurricanes on sinus infections remains unclear.^{3,4} Anecdotal reports suggest that more patients seek care for sinus infections after a hurricane, highlighting the need for further research on this potential connection.

To assess whether hurricane-affected populations experienced an increase in sinus infections, we examined encounters for either acute or chronic sinus infections in the six-week period following landfall of hurricanes Ian (2022), Nicole (2022), Idalia (2023), and Debby (2024).⁵⁻⁸ We compared these periods to the same timeframe in the year before and after each hurricane. We compared Debby to the two years prior because it was too recent to compare to the year after. Our study population included residents of affected ZIP codes in Florida, Georgia, and South Carolina who had a healthcare encounter during the relevant study period.

We found that the impact of hurricanes on sinus infection rates was minimal. Despite some minor fluctuations, we did not observe a consistent change in acute or chronic sinus infections in the weeks following any of the hurricanes studied compared to the years before and after. However, seasonal increases in sinus infection rates coincide with when hurricanes often make landfall and have a much more noticeable effect, as seen in Figures 1 and 2.

Annual Comparisons of Acute Sinus Infections Post Hurricane by Hurricane Path



"Annual Comparisons of Acute Sinus Infections Post Hurricane by Hurricane Path," 2025. EpicResearch.org

Figure 1. Five-week rolling average of seasonal acute sinus infection rates in the geographic areas affected by hurricanes Ian, Nicole, Idalia, and Debby.

Annual Comparisons of Chronic Sinus Infections Post Hurricane by Hurricane Path

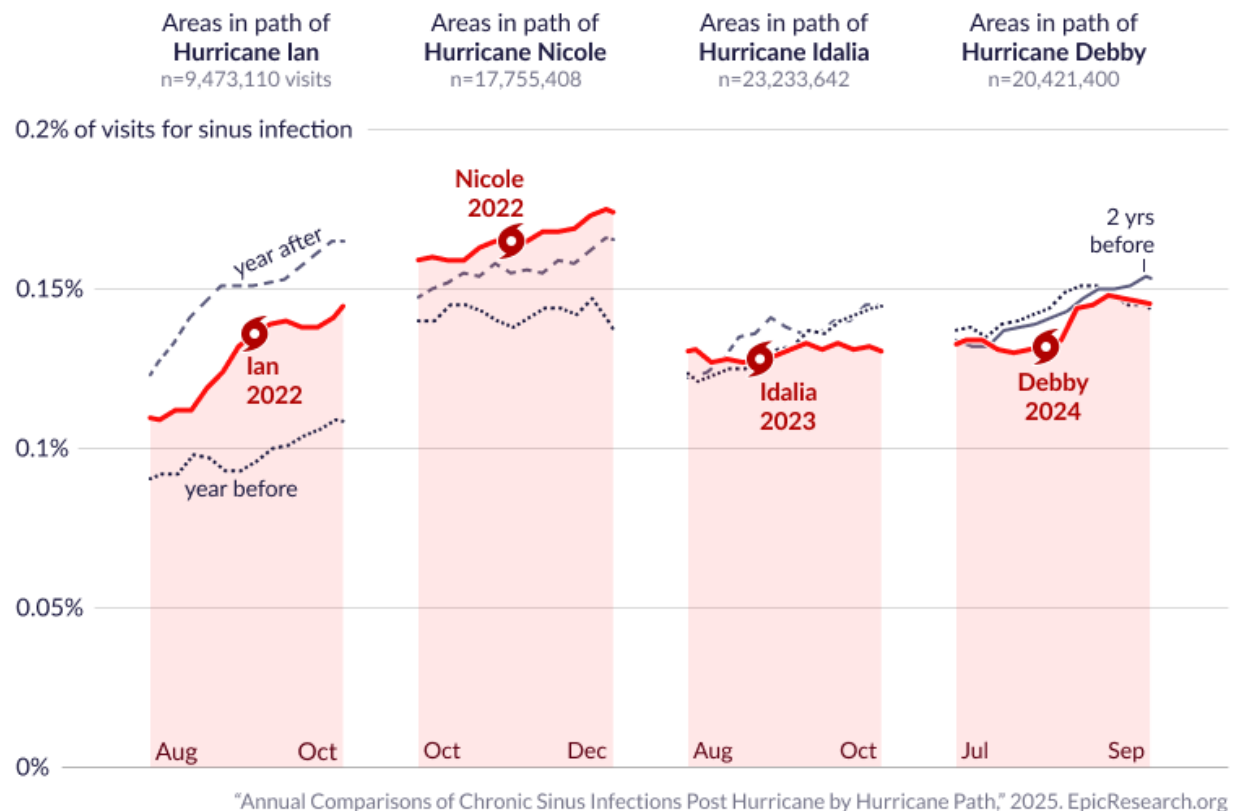


Figure 2. Five-week rolling average of seasonal chronic sinus infection rates over time in the geographic areas affected by hurricanes Ian, Nicole, Idalia, and Debby.

These data come from Cosmos, a dataset created in collaboration with a community of Epic health systems representing more than 296 million patient records from 1,600 hospitals and more than 37,000 clinics from all 50 states, Lebanon, and Saudi Arabia. This study was completed by two teams that worked independently, each composed of a clinician and research scientists. The two teams came to similar conclusions. Graphics by Brian Olson.

References

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Data Definitions

Term	Definition
Study period	Time periods differ by storm: Ian: Landfall 9/18/22 6-week period 9/16/2022–10/27/2022 Nicole: Landfall 11/10/22 6-week period: 11/11/2022–12/22/2022 Idalia: Landfall 8/29/23 6-week period: 9/1/2023–10/12/2023 Debby: Landfall 8/5/24 6-week period: 8/9/2024–9/19/2024
Study population	Encounters with a patient whose last recorded address was in an affected ZIP code and one of the following states: - Ian: Florida - Nicole: Florida - Idalia: Florida, Georgia, South Carolina - Debby: Florida, Georgia, South Carolina
Outcomes	A diagnosis of acute sinus infection or chronic sinus infection
Affected ZIP codes	Ian: 32951, 32920, 32931, 32937, 32901, 32781, 32796, 32754, 32953, 97625, 32780, 32927, 32926, 32903, 32935, 32904, 32955, 32925, 34786, 32960, 32958, 32963, 32967, 34788, 34748, 32767, 34714, 32757, 32711, 34996, 34957, 33455, 34956, 34997, 34974, 34972, 32827, 34787, 32826, 32751, 32805, 32832, 32810, 32821, 32836, 32809, 32819, 32818, 34744, 34741, 31907, 34771, 34773, 32773, 32771, 33876, 32708, 32746, 32765, 32732, 12546, 34950, 34945, 34982, 34984, 34949, 32168, 32114, 32176, 32724, 32738, 32759, 32130, 32950, or 32949 Nicole: 32064, 32177, 33440, 32351, 32320, 33431, 34601, 33830, 34428, 33755, 32925, 32225, 32628, 32114, 32724, 32110, 33304, 32034, 34950, 32348, 33881, 32601, 34450, 34741, 32207, 33815, 34748, 33462, 33261, 32827, 32901, 32212, 32227, 34974, 34475, 32803, 33401, 33563, 33701, 33870, 32771, 32084, 34236, 34994, 32301, 33601, 32815, 33610, 32960, 33853, 32958, 32696, 32920, 33542, 30344, 32625, 30125, 32257, 34228, 32226, 33619, 35901, 33460, 32233, 32277, 33616, 33019, 34221, 33606, 34667, 34689, 33611, 32899, 32782, 32796, 32759, 32780, 32953, 32926, 32615, 34266, 33598, 33430, 33827, 34483, 33525, 33527, 32180, 33850,

34762, 32666, 34758, 32703, 32145, 32784, 34787, 33414, 33426, 32952, 32931, 32904, 33004, 33132, 33062, 33455, 32080, 32949, 34957, 33408, 32951, 33407, 33125, 32168, 33458, 32950, 34982, 33756, 33711, 33351, 34698, 34224, 33810, 34639, 33477, 34250, 34602, 34606, 32066, 32424, 32328, 32344, 32308, 32082, 32648, 32304, 34996, 32327, 33483, 33444, 33471, 34946, 34949, 33898, 32962, 32976, 33930, 33470, 33837, 32805, 32073, 32955, 32640, 34786, 32653, 32927, 32757, 32832, 32935, 32763, 32708, 34769, 33021, 34761, 32738, 32725, 32779, 32259, 32223, 32948, 33418, 32092, 33138, 33161, 33823, 33411, 32940, 32707, 33576, 33825, 32134, 32130, 32767, 33844, 34966, or 32967

Idalia: 33040, 33050, 33070, 33042, 34104, 33315, 33309, 33033, 33023, 33142, 33014, 33406, 33064, 33186, 34142, 34114, 33461, 33030, 33431, 33351, 33167, 33012, 33326, 33136, 33065, 33322, 33124, 33471, 33935, 33071, 33426, 33477, 33025, 33407, 33178, 33476, 34139, 34119, 34974, 33467, 34141, 33473, 33187, 32827, 32773, 34741, 34788, 32114, 32780, 32901, 32960, 34946, 34996, 32952, 32931, 32904, 33455, 32949, 32169, 32950, 34957, 32690, 32925, 32899, 32953, 33607, 34219, 34211, 34241, 33914, 34120, 33844, 33545, 33830, 32696, 34429, 34450, 33542, 33765, 33606, 33592, 33563, 33811, 33859, 33876, 34285, 33946, 33621, 33619, 32625, 34689, 34667, 33901, 33701, 33767, 33605, 34221, 33616, 34660, 34237, 33905, 33810, 33756, 34224, 34613, 33558, 33982, 33950, 33952, 33957, 34270, 33712, 33778, 33776, 33773, 32680, 34135, 34639, 33620, 34610, 36339, 33980, 34668, 33825, 34695, 33771, 33852, 34243, 34652, 33525, 34461, 33870, 33513, 34638, 33602, 34428, 33960, 34265, 34677, 34653, 33760, 34690, 32621, 33541, 32683, 34609, 34785, 33965, 33916, 33928, 33908, 33645, 33634, 34434, 34637, 33764, 33766, 34452, 33647, 33540, 32348, 32327, 32320, 32310, 32329, 32347, 32628, 32328, 32006, 32648, 32340, 32355, 32344, 32301, 32308, 32309, 32322, 32303, 32218, 32225, 32227, 32609, 32202, 32060, 32619, 32064, 32052, 31706, 31601, 31699, 31794, 31750, 31788, 31647, 31629, 31793, 31643, 31503, 31510, 31546, 31522, 31542, 31408, 30442, 30429, 29488, 30461, 30467, 30453, 31409, 29810, 30439, 31314, 31327, 31328, 31401, 29927, 30906, 30904, 30824, 29404, 29455, 29461, 29926, 29483, 29466, 29906, 29907, 29415, 29469, 29451, 29482, 29412, 29439, 29920, 29115, 29044, 29152, 29812, 29102, 29112, 29802, 29172, 29205, 29009, 29520, 29720, 29132, 29108, 29582, 29577, 29527, 29440, 29556, 29574, 29506, 29550, 29540, 29512, 23337, 23602, 23518, 23505, 23669, 23460, 23456, 33483, 33004, 33408, 33062, 33149, 33316, 33460, 226101, 34236, 33711, 32080, 32226, 32250, 32084, 28451, 28480, 28449, 28462, 29576, 28465, or 21843

Debby: 33607, 33762, 33701, 34243, 33982, 33907, 33913, 33881, 34604, 32310, 32329, 32827, 32773, 34788, 32114, 32901, 32960, 34946, 34104, 33315, 33309, 33033, 33142, 33014, 33406, 33064, 33186, 33040, 33050, 32225, 32609, 32218, 32222, 32226, 33830, 32696, 34429, 34450, 33542, 33765, 33606, 33592, 33563, 33811, 33859, 33876, 34285, 33946, 33616, 32347, 34741, 32780, 34996, 33440, 33431, 33461, 33037, 32060, 32177, 32091, 32034, 34474, 32095, 33480, 34114, 33042, 34108, 33140, 33430, 33025, 33458,

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Acute sinusitis	A diagnosis with ICD-10-CM code J01*
Chronic sinusitis	A diagnosis with ICD-10-CM code J32*
Limitations	Idalia's and Debby's paths were through a part of Florida with less healthcare access than the paths of Ian and Nicole. For example, several of the counties in the north, closer to the panhandle, have encounter counts in the hundreds for those six months while Orlando has 1.2 million, and the surrounding counties have around 100,000. Ian and Nicole were separated by about two months. The compounding effect of being in the path of both storms was not evaluated.

Table 1: Hurricane Ian Rates of Chronic and Acute Sinusitis

2021	% Chronic	% Acute	2022	% Chronic	% Acute	2023	% Chronic	% Acute
Jul 30 – Aug 5	0.09%	0.11%	Jul 29 – Aug 4	0.11%	0.18%	Jul 28 – Aug 3	0.12%	0.19%
Aug 6 – Aug 12	0.09%	0.10%	Aug 5 – Aug 11	0.11%	0.18%	Aug 4 – Aug 10	0.13%	0.19%
Aug 13 – Aug 19	0.09%	0.10%	Aug 12 – Aug 18	0.11%	0.18%	Aug 11 – Aug 17	0.13%	0.20%
Aug 20 – Aug 26	0.10%	0.10%	Aug 19 – Aug 25	0.11%	0.20%	Aug 18 – Aug 24	0.14%	0.20%
Aug 27 – Sep 2	0.10%	0.10%	Aug 26 – Sep 1	0.12%	0.21%	Aug 25 – Aug 31	0.15%	0.21%
Sep 3 – Sep 9	0.09%	0.11%	Sep 2 – Sep 8	0.12%	0.23%	Sep 1 – Sep 7	0.15%	0.21%
Sep 10 – Sep 16	0.09%	0.12%	Sep 9 – Sep 15	0.13%	0.24%	Sep 8 – Sep 14	0.15%	0.22%
Sep 17 – Sep 23	0.10%	0.12%	Sep 16 – Sep 22	0.14%	0.25%	Sep 15 – Sep 21	0.15%	0.22%
Sep 24 – Sep 30	0.10%	0.12%	Sep 23 – Sep 29	0.14%	0.25%	Sep 22 – Sep 28	0.15%	0.22%
Oct 1 – Oct 7	0.10%	0.13%	Sep 30 – Oct 6	0.14%	0.25%	Sep 29 – Oct 5	0.15%	0.22%
Oct 8 – Oct 14	0.10%	0.14%	Oct 7 – Oct 13	0.14%	0.25%	Oct 6 – Oct 12	0.16%	0.23%
Oct 15 – Oct 21	0.11%	0.14%	Oct 14 – Oct 20	0.14%	0.25%	Oct 13 – Oct 19	0.16%	0.24%
Oct 22 – Oct 28	0.11%	0.14%	Oct 21 – Oct 27	0.14%	0.25%	Oct 20 – Oct 26	0.17%	0.25%
Oct 29 – Nov 4	0.11%	0.15%	Oct 28 – Nov 3	0.15%	0.26%	Oct 27 – Nov 2	0.16%	0.26%

Table 2: Hurricane Nicole Rates of Chronic and Acute Sinusitis

2021	% Chronic	% Acute	2022	% Chronic	% Acute	2023	% Chronic	% Acute
Oct 1 – Oct 7	0.14%	0.15%	Sep 30 – Oct 6	0.16%	0.22%	Sep 29 – Oct 5	0.15%	0.20%
Oct 8 – Oct 14	0.14%	0.14%	Oct 7 – Oct 13	0.16%	0.22%	Oct 6 – Oct 12	0.15%	0.20%
Oct 15 – Oct 21	0.14%	0.15%	Oct 14 – Oct 20	0.16%	0.22%	Oct 13 – Oct 19	0.15%	0.21%
Oct 22 – Oct 28	0.14%	0.15%	Oct 21 – Oct 27	0.16%	0.22%	Oct 20 – Oct 26	0.16%	0.22%
Oct 29 – Nov 4	0.14%	0.15%	Oct 28 – Nov 3	0.16%	0.23%	Oct 27 – Nov 2	0.15%	0.22%
Nov 5 – Nov 11	0.14%	0.16%	Nov 4 – Nov 10	0.16%	0.24%	Nov 3 – Nov 9	0.16%	0.24%
Nov 12 – Nov 18	0.14%	0.17%	Nov 11 – Nov 17	0.16%	0.25%	Nov 10 – Nov 16	0.16%	0.24%
Nov 19 – Nov 25	0.14%	0.17%	Nov 18 – Nov 24	0.17%	0.25%	Nov 17 – Nov 23	0.16%	0.24%
Nov 26 – Dec 2	0.14%	0.17%	Nov 25 – Dec 1	0.17%	0.25%	Nov 24 – Nov 30	0.15%	0.24%
Dec 3 – Dec 9	0.14%	0.18%	Dec 2 – Dec 8	0.17%	0.27%	Dec 1 – Dec 7	0.16%	0.24%
Dec 10 – Dec 16	0.14%	0.19%	Dec 9 – Dec 15	0.17%	0.28%	Dec 8 – Dec 14	0.16%	0.25%
Dec 17 – Dec 23	0.15%	0.18%	Dec 16 – Dec 22	0.17%	0.30%	Dec 15 – Dec 21	0.16%	0.26%
Dec 24 – Dec 30	0.14%	0.18%	Dec 23 – Dec 29	0.17%	0.30%	Dec 22 – Dec 28	0.17%	0.26%
Dec 31 – Jan 6	0.13%	0.18%	Dec 30 – Jan 5	0.17%	0.30%	Dec 29 – Jan 4	0.16%	0.26%

Table 3: Hurricane Idalia Rates of Chronic and Acute Sinusitis

2022	% Chronic	% Acute	2023	% Chronic	% Acute	2024	% Chronic	% Acute
Jul 29 – Aug 4	0.12%	0.13%	Jul 28 – Aug 3	0.13%	0.14%	Jul 26 – Aug 1	0.12%	0.13%
Aug 5 – Aug 11	0.12%	0.13%	Aug 4 – Aug 10	0.13%	0.14%	Aug 2 – Aug 8	0.12%	0.13%
Aug 12 – Aug 18	0.12%	0.14%	Aug 11 – Aug 17	0.13%	0.15%	Aug 9 – Aug 15	0.12%	0.13%
Aug 19 – Aug 25	0.13%	0.15%	Aug 18 – Aug 24	0.13%	0.15%	Aug 16 – Aug 22	0.13%	0.13%
Aug 26 – Sep 1	0.12%	0.15%	Aug 25 – Aug 31	0.13%	0.16%	Aug 23 – Aug 29	0.13%	0.15%
Sep 2 – Sep 8	0.13%	0.16%	Sep 1 – Sep 7	0.13%	0.16%	Aug 30 – Sep 5	0.14%	0.16%
Sep 9 – Sep 15	0.13%	0.17%	Sep 8 – Sep 14	0.13%	0.17%	Sep 6 – Sep 12	0.14%	0.17%
Sep 16 – Sep 22	0.13%	0.17%	Sep 15 – Sep 21	0.13%	0.17%	Sep 13 – Sep 19	0.14%	0.17%
Sep 23 – Sep 29	0.14%	0.18%	Sep 22 – Sep 28	0.13%	0.17%	Sep 20 – Sep 26	0.14%	0.17%
Sep 30 – Oct 6	0.14%	0.18%	Sep 29 – Oct 5	0.13%	0.18%	Sep 27 – Oct 3	0.14%	0.17%
Oct 7 – Oct 13	0.14%	0.19%	Oct 6 – Oct 12	0.13%	0.18%	Oct 4 – Oct 10	0.14%	0.17%
Oct 14 – Oct 20	0.14%	0.19%	Oct 13 – Oct 19	0.13%	0.18%	Oct 11 – Oct 17	0.14%	0.17%
Oct 21 – Oct 27	0.14%	0.20%	Oct 20 – Oct 26	0.13%	0.19%	Oct 18 – Oct 24	0.14%	0.18%
Oct 28 – Nov 3	0.14%	0.20%	Oct 27 – Nov 2	0.13%	0.19%	Oct 25 – Oct 31	0.15%	0.18%

Table 4: Hurricane Debby Rates of Chronic and Acute Sinusitis

2022	% Chronic	% Acute	2023	% Chronic	% Acute	2024	% Chronic	% Acute
Jul 1 – Jul 7	0.13%	0.16%	Jun 30 – Jul 6	0.14%	0.16%	Jun 28 – Jul 4	0.13%	0.14%
Jul 8 – Jul 14	0.13%	0.16%	Jul 7 – Jul 13	0.14%	0.16%	Jul 5 – Jul 11	0.13%	0.14%
Jul 15 – Jul 21	0.13%	0.15%	Jul 14 – Jul 20	0.14%	0.16%	Jul 12 – Jul 18	0.13%	0.14%
Jul 22 – Jul 28	0.14%	0.16%	Jul 21 – Jul 27	0.14%	0.15%	Jul 19 – Jul 25	0.13%	0.14%
Jul 29 – Aug 4	0.14%	0.16%	Jul 28 – Aug 3	0.14%	0.15%	Jul 26 – Aug 1	0.13%	0.13%
Aug 5 – Aug 11	0.14%	0.16%	Aug 4 – Aug 10	0.14%	0.16%	Aug 2 – Aug 8	0.13%	0.13%
Aug 12 – Aug 18	0.14%	0.17%	Aug 11 – Aug 17	0.14%	0.16%	Aug 9 – Aug 15	0.13%	0.14%
Aug 19 – Aug 25	0.14%	0.18%	Aug 18 – Aug 24	0.15%	0.17%	Aug 16 – Aug 22	0.13%	0.14%
Aug 26 – Sep 1	0.15%	0.19%	Aug 25 – Aug 31	0.15%	0.18%	Aug 23 – Aug 29	0.14%	0.15%
Sep 2 – Sep 8	0.15%	0.19%	Sep 1 – Sep 7	0.15%	0.18%	Aug 30 – Sep 5	0.14%	0.16%
Sep 9 – Sep 15	0.15%	0.20%	Sep 8 – Sep 14	0.15%	0.19%	Sep 6 – Sep 12	0.15%	0.17%
Sep 16 – Sep 22	0.15%	0.21%	Sep 15 – Sep 21	0.14%	0.19%	Sep 13 – Sep 19	0.15%	0.18%
Sep 23 – Sep 29	0.15%	0.21%	Sep 22 – Sep 28	0.14%	0.19%	Sep 20 – Sep 26	0.15%	0.18%
Sep 30 – Oct 6	0.15%	0.21%	Sep 29 – Oct 5	0.14%	0.20%	Sep 27 – Oct 3	0.14%	0.18%