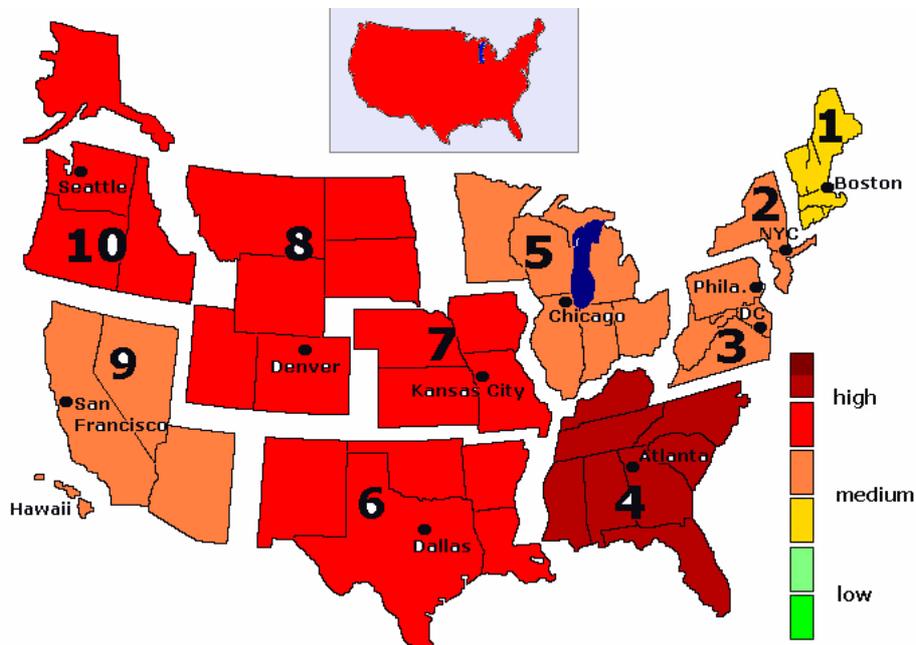# U.S. Flu Forecasts — 2009 Week Week 39 (Produced 3 October)

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Summary for week Week 39 (Produced 3 October)

- The CDC reports in week 37 that the %weighted ILI (the percentage of outpatient visits for influenza-like illness) stands at 4.65. Google Flu Trends estimates ILI% for week 37 at 3.8.

- The rate of increase in influenza activity in the US has slowed down in week 37. **If the slowdown is genuine, the M2 week 38 nowcast is 4.7%, for week 39 it is 4.6%**. If not, then the average nowcast is 4.9 and 5.2%.

- ILI% in the US is more than double the national baseline of 2.4%, and higher than the peak of last season.

- Flu activity in 9 regions is above their region-specific baseline, based on week 38 and 39 nowcasts. Only region 1 is below its baseline.

Current Influenza Activity

Percentage of visits for influenza–like illness (ILI) with nowcasts for weeks 38,39
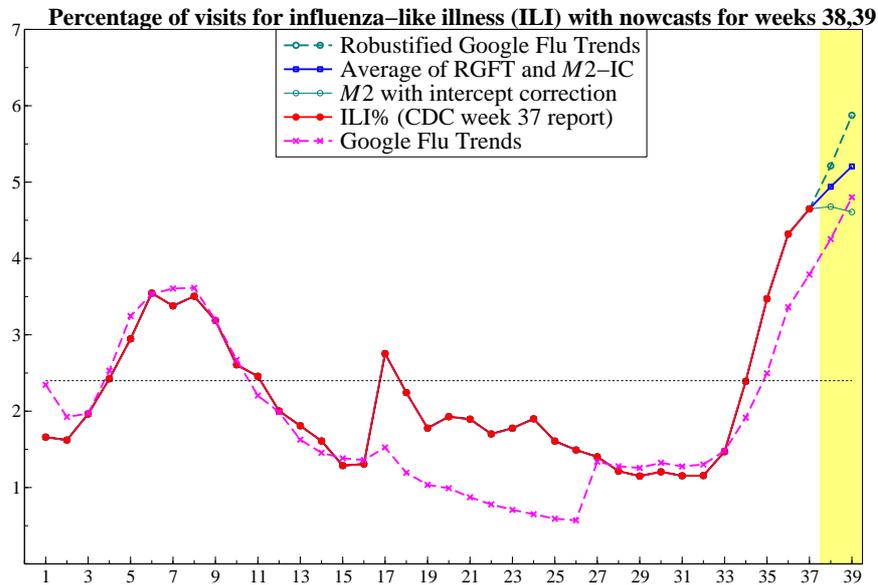
- Robustified Google Flu Trends (RGFT) shows a further increase of ILI% in weeks 38 and 39: 5.2% and 5.9% respectively. This uses the revised GFT data. This is based on the changes in the logit of Google Flu Trends (GFT), applied to the ILI% level reported in the CDC influenza report for week 37.

- The rapid growth of weeks 33-35 is very well described by a linear trend: the logit increased by 0.2, 0.4, 0.6 respectively. This corresponds approximately with increases of 20%, 40% and 60% in flu activity (ILI%). Week 36 shows a slower increase at 0.3 and week 37 is back at 0.2. In comparison, during the winter peak in a normal flu season (weeks 50-51 and 3-6), there is an average weekly increase of about 20%. This trend could not be clearly seen two week ago, but is now estimated with high significance in the model M2.

  The nowcasts make the assumption that the trend follows a 1,2,3,1.5,1,0 pattern (multiplied by the estimated coefficient of 0.2), based on the hypothesis that the slowdown continues. Model M2 nowcasts, *based on this trend*, report a stagnating ILI%: 5.7% and 4.6% respectively.

- The average nowcasts for week 38 and 39, based on pooling a dynamic model with calendar effects (M2) and RGFT, show an increase in ILI%: 4.9% and 5.2% respectively.

Expected Influenza Activity

Historically, there tends to be a fairly slow increase in ILI% until Thanksgiving Day. The Thanksgiving holidays are associated with an additional increase of 15%. It is clear that this season is already developing in a very different way.

Flu Season Forecasts of Influenza Activity

Flu season forecasts based on average of M2 and RGFT
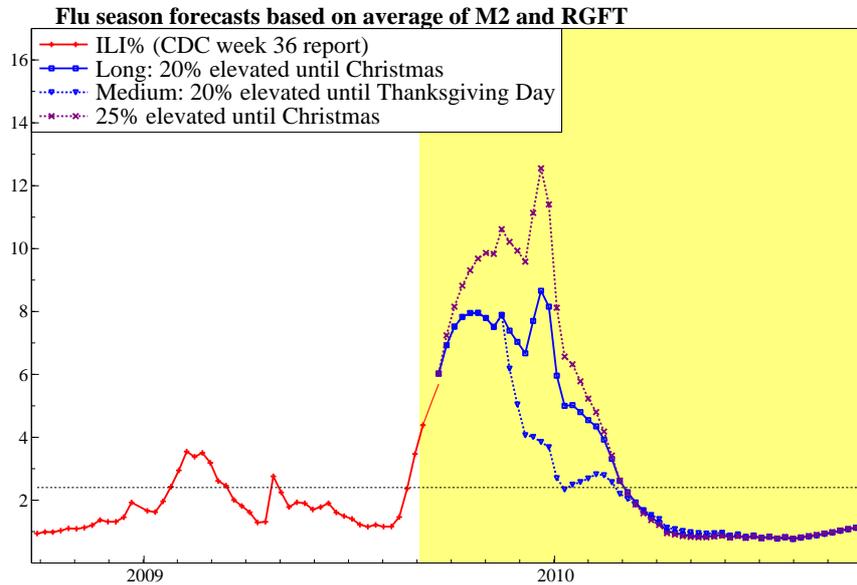
The scenarios have not been updated, and are as in the week 38 report.

The dynamic model $M2$ describes normal flu seasons quite well, but is inappropriate during pandemic flu. For that reason, scenarios are reported.

The one-year ahead forecasts use the average nowcasts for week 37 and 38 as the starting point for forecasting. Then three assumptions are used to capture pandemic flu activity:

- *Medium* 20%: the period of elevated activity lasts until Thanksgiving Day. This is captured by a trend effect estimated over weeks 33 to 37 which is increasing until week 35 then decreasing. From week 38 until Thanksgiving Day 0.2 is added to the intercept (a 20% increase in ILI). This is the dotted blue line. Note that Thanksgiving Day is usually associated with an increase in flu activity.

- *Long* 20%: the period of elevated activity is extended until the week before Christmas, the solid blu line.

- *Long* 25%: the coefficient is increased from 0.2 to 0.25, and runs until the week before Christmas (the dotted purple line).

Note that the dynamics in the model effectuates a moderating effect after a longer period of very rapid increase. If these assumptions hold, very high levels of ILI% should be expected.

References

– www.cdc.gov/flu/weekly/

– www.google.com/flutrends

– Doornik, Jurgen A. (2009), 'Improving the Timeliness of Data on Influenza-like Illnesses using Google Search Data'. Mimeo, University of Oxford.