

# U.S. Flu Forecasts — 2009 Week 35

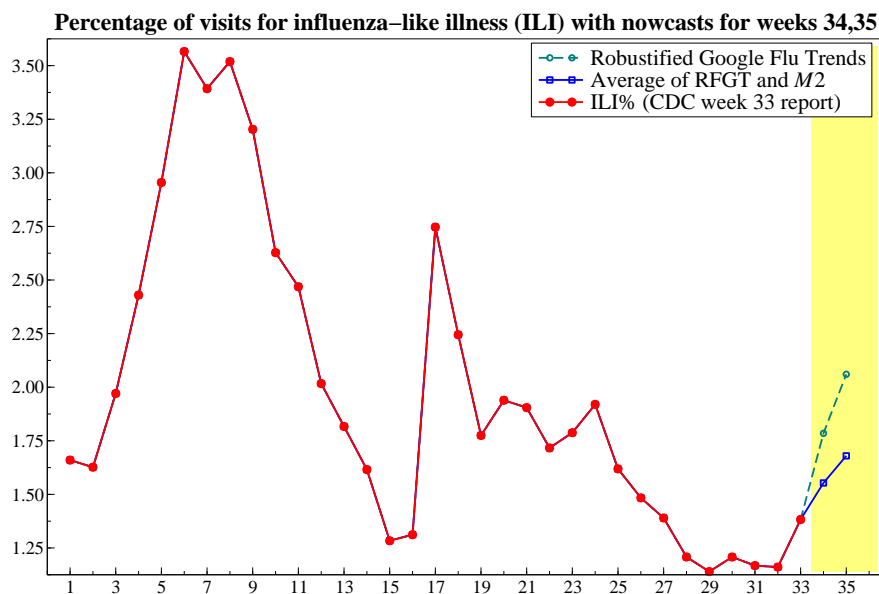
Jurgen A. Doornik\*University of Oxford, UK

September 5, 2009

## Summary

- The CDC reports in week 33 that the % weighted ILI (the percentage of outpatient visits for influenza-like illness) stands at 1.383. Google Flu Trends estimates this too low at 0.459.
- During weeks 34 (ending 29 August) and 35 (ending 5 September), influenza activity in the US has been rising rapidly.
- ILI% in the US is forecast to breach the national baseline of 2.4% by mid-September 2009.
- Flu activity in the US this winter could exceed the recent peak of the 2003-04 season.

## Current Influenza Activity



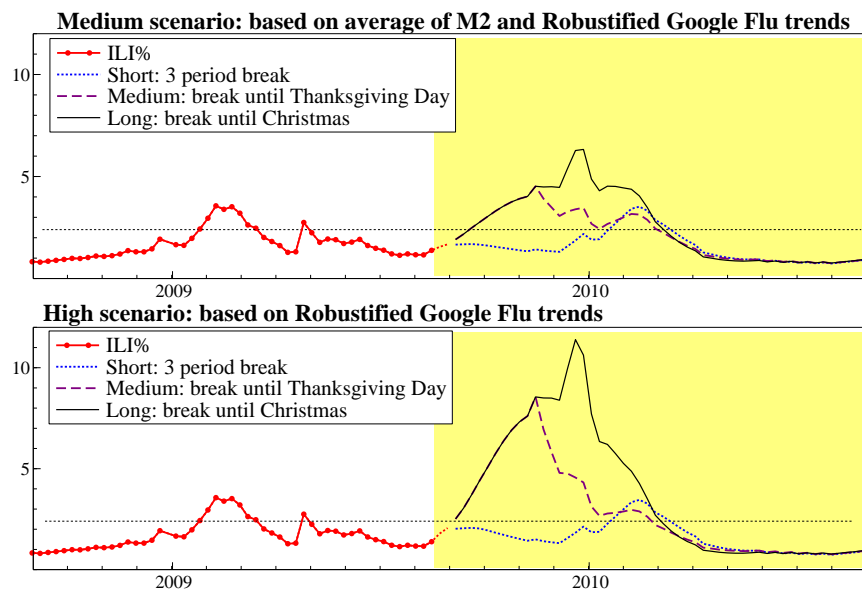
\*Disclaimer. The results reported here are based on forecast, and are therefore uncertain. These results are my personal opinion, based on extensive modeling, and not endorsed by either the CDC or Google.

- Robustified Google Flu Trends (RGFT) shows a rapid increase of ILI% in weeks 34 and 35. 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 33. GFT has, at least on some past occasions, over-estimated the increase in this particular period.
- The average nowcasts for week 34 and 35, based on pooling a dynamic model with calendar effects ( $M2$ ) and RGFT, show an increase in ILI% in weeks 34 and 35. During weeks 27 to 33, RGFT has produced better nowcasts than the pooled model. Historically, the pooled model has performed better.
- Model  $M2$  nowcasts, *assuming that the increase in week 33 is for that week only*, reports a level ILI%. This assumption is unlikely to be correct. There is a relatively large discrepancy between the nowcasts. One reason is that this is an unusual flu season. A second is that in these weeks ILI% rises quite rapidly, and it is harder to determine the gradient precisely.

## Expected Influenza Activity

Historically, there tends to be an increase in ILI% after Labor Day (when schools start; week 36 this year). However, this is normally offset by declines in the week before and afterwards.

## Forecasts of Influenza Activity



- The *medium scenario* gives one-year ahead forecasts from model  $M2$ , using the average nowcasts for week 34 and 35 as the starting point.
- The *high scenario* gives one-year ahead forecasts from model  $M2$ , using the RGFT nowcasts for week 34 and 35 as the starting point.

The level in week 33, and the nowcasted level for weeks 34 and 35 exceed those that are expected from the baseline model *M2*. Three types of assumptions are made regarding this break (i.e. the elevated level):

- *Short*: the current break lasts only for three weeks (33 to 35). This is the blue dotted line.
- *Medium*: the current break lasts until Thanksgiving Day. This is the purple long-dashed line (partially coinciding with the solid black line).
- *Long*: the current break lasts until the week before Christmas, the solid black line.

It is unlikely that the break in ILI has already finished. Therefore, even using the medium scenario, ILI% is expected to go above the US national baseline of 2.4% in the second half of September (week 38 or 39). It is not impossible that this will already happen in week 37.

If the break does indeed persist, very high levels of ILI% should be expected.

## References

- [www.cdc.gov/flu/weekly/](http://www.cdc.gov/flu/weekly/)
- [www.google.com/flutrends](http://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.