Forecasting Trends in Syphilis using Prediction Markets

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Introduction:

Prediction markets have accurately predicted:
   election outcomes,
   marketing potential (pharmaceuticals, films),
   influenza trends.
We are using markets to
   predict number of syphilis cases.
We hope to use future markets to:
   forecast other trends in syphilis,
   predict Intervention outcomes.

Methods:

Traders recruited from diverse backgrounds.
   More are needed—please sign up!
Traders are given $100 to buy shares.
Shares represent predictions
   (e.g. 2200-2399 cases by the end of the quarter)
When the market closes, traders receive $1 per share
   for correct predictions, other shares are worthless.
During the market, share price reflects traders'
   expectations that the outcome will
   fall in the range covered by those shares.
Current Markets, For the first quarter of 2010:
   Total U.S. P&S cases,
   Female U.S. P&S cases.

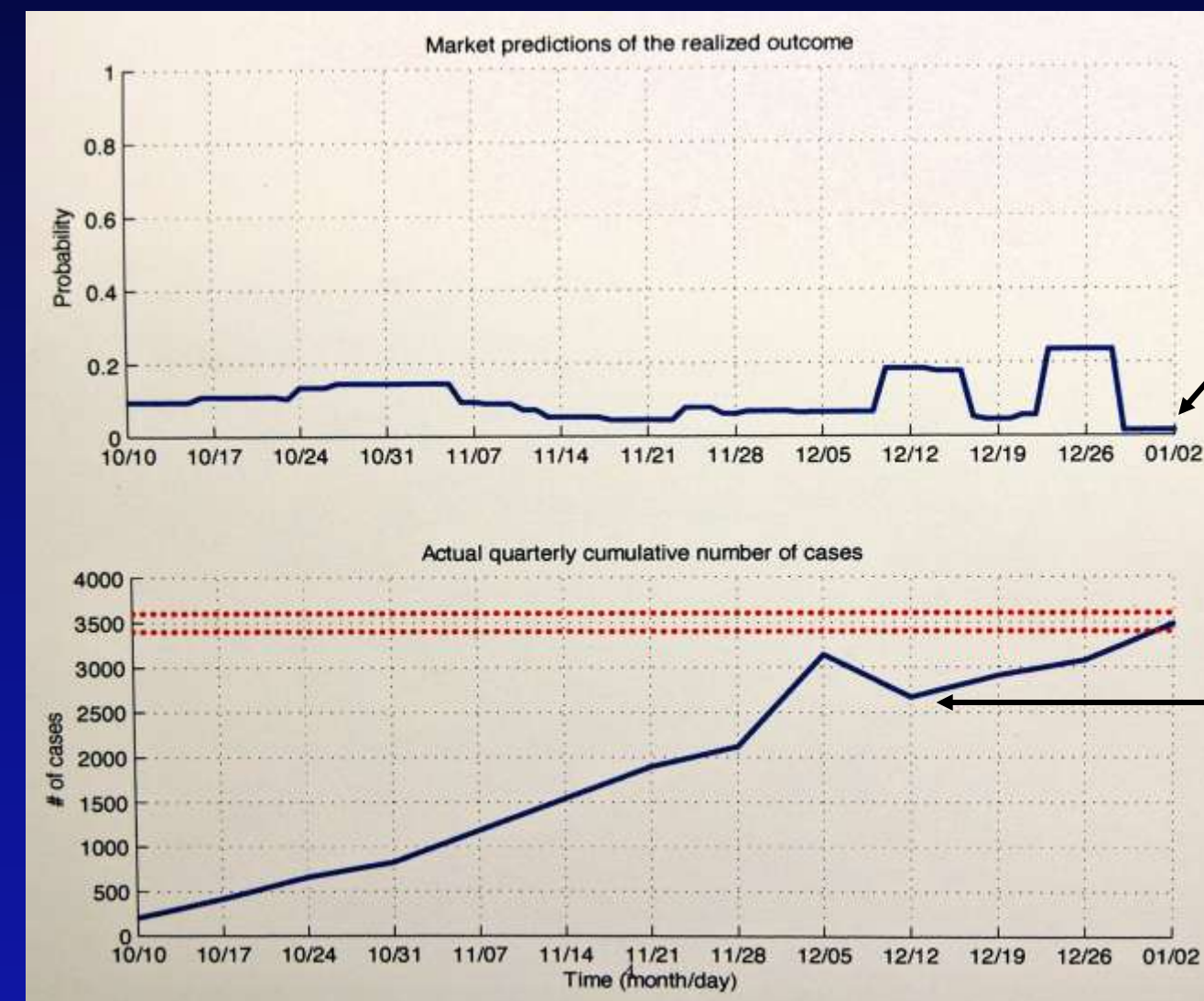## The Web Trading Page looks like this:

Past quarters

Quarter we are predicting
in the current market

Offers to buy and sell
set the trading price, and
reflect market's prediction
(most predict 3200 or Lower).

Results:

In Quarter 4 of 2009, the market
   totally missed actual number of
   MMWR cases.
Actual Quarterly Total was predicted
   to have less than 2% probability
   of occurring!

MMWR cumulative
   counts decreased
   one week!

MMWR Notifiable Diseases and Mortality Tables

weeks ending December 5, 2009, and November 29, 2008
   Syphilis, primary and secondary
                  previous

Current week	52 week Med	Max	Cum 2009	Cum 2008
112	287	452	12,940	12,027

weeks ending November 29, 2008, and December 1, 2007
   Syphilis, primary and secondary
                  previous

Current week	52 week Med	Max	Cum 2008	Cum 2007
78	241	351	11,007	10,339

MMWR "cumulative number"
   from 2008 is not the same
   as it was on that day in 2008!

Conclusions:

Syphilis predictions markets are up and running.
   You should join!
Market did not accurately predict MMWR totals
   in Quarter 4 of 2009.
Participants may have been using MMWR data
   to guide their trading activity rather
   than private/local information.
Accuracy of this pilot market could have been
   affected by:
      too few traders,
      limited trader information on national trends,
      idiosyncrasies in MMWR.
Give us your ideas for future markets!

Join us! Sign up for an account
   at http://iehm.uiowa.edu or
   send comments to:
   forrest-nelson@uiowa.edu or
   tpeterman@cdc.gov