Modeling the Effects of Policies and Interventions on Adult Smoking Prevalence

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Modeling: What is it good for?

- Modeling is a great **heuristic** tool
- Modeling helps **reveal relationships** by organizing the channels of influence and by making assumptions explicit
- The formalization of relationships and assumptions through modeling usually proves **more robust than** the informal approach of relying on **intuition alone**.
- As such, models are **useful for evaluating alternative futures**

Two Types of Models, for Different Purposes

- Data-driven models:
  - Are derived from data/studies, e.g., how effective past policies have been in affecting smoking rates
  - Useful in understanding and predicting how changes in inputs lead to changes in outputs, e.g., how individual policies and combinations of policies might impact future smoking prevalence
- Speculative or "what if" models:
  - Are not data-driven, but are based on specific assumptions about inputs, e.g., allow for changes in the factors that drive smoking cessation in order to see what would happen to smoking prevalence if this could be done.
  - Are useful for stimulating out-of-the-box thinking and have heuristic value. We will examine what it would take to reach Healthy People 2010 goals and other targets for smoking prevalence.

Other info about today's models

- All models are adult focused
  - Prevention of smoking uptake is not considered as a policy or intervention, as it will have a small influence on adult smoking prevalence in the next 15 years (Levy, Cummings et al (2000).
  - All policies/interventions are directed at adults aged 18 and over
- Begin with a status quo model of future trends (starting in 2006)
  - Assumes that policies stay at their 2006 levels in future years
  - Assumes **Cessation** from and **Relapse** back to smoking occurs at a constant rate over time, based on current rates.
  - Assumes **New smokers** take up smoking at a constant rate, based on recent data

Other info about today's models-2

- Policy/Interventions
  - Policies go into effect in the year **2007** and are sustained through the year 2020
  - Policies affect cessation rates through quit attempts, quit success, and/or relapse in the first year (long-term abstinence), which is then translated into percentage changes in prevalence
  - Takes into account the past level of policies/interventions

Outline for Today's Talk

- 3-shot Model (speculative, "what if" scenarios)
- Traditional Policies (taxes, clean air, media) Model (data driven)
- Cessation Treatment Policies Model (data-driven)
- Full Throttle Model (combination data-driven & speculation)
- Discussion

3-Shot Model

- This model presents a series of “what if” scenarios. This is a speculative model.

- What if we could…

1. increase the number of smokers making quit attempts?
2. increase the number of smokers who use evidence-based treatments?
3. Increase long term abstinence across all forms of treatment?

One-Shot Model: Quit Attempts

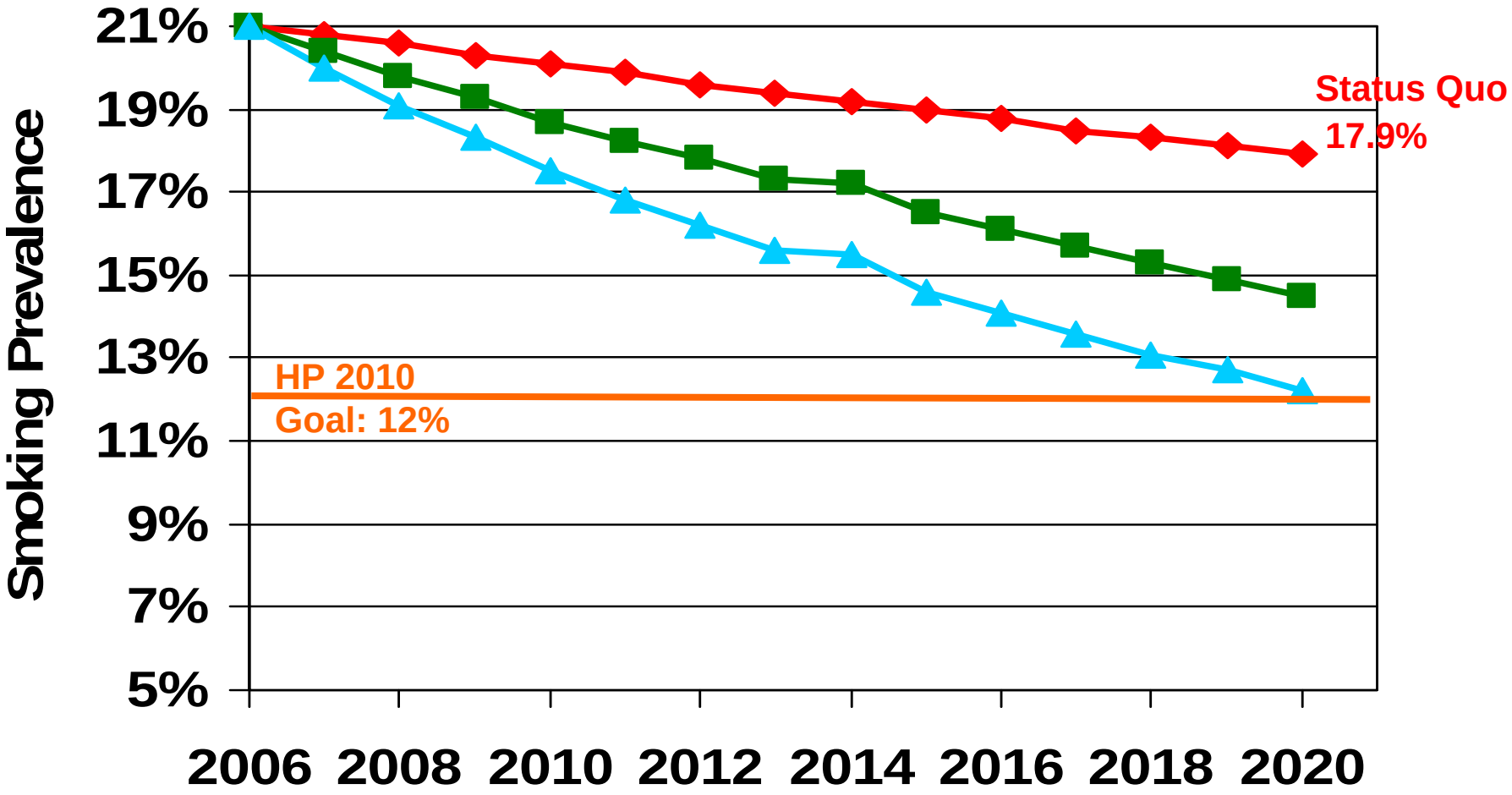
What if we could…

A. Increase the number of people making quit attempts by 50%: **from 40% of smokers to 60%** of smokers annually?

B. Increase the number of people making quit attempts by 100%: **from 40% of smokers to 80%** of smokers annually.

One-shot Model - "What if we could increase…?"

Quit Attempts



60% of smokers make quit attempt: 2020 prev = 14.6%

80% smokers make quit attempt: 2020 prev = 12.3%

One-Shot Model: Double the Use of Evidence Based Treatment

Of those making a quit attempt in the last year, what if we could double the use of EB treatments such that…

- from 22% to 44% who use FDA approved pharmacotherapy alone,
- from 2% to 4% who use behavioral therapy alone, **and**
- from 4% to 8% who use a combination of evidence based pharmacotherapy and behavioral therapy.

Two-Shot Model: Quit Attempts & Evidence Based Treatment Use

What if …

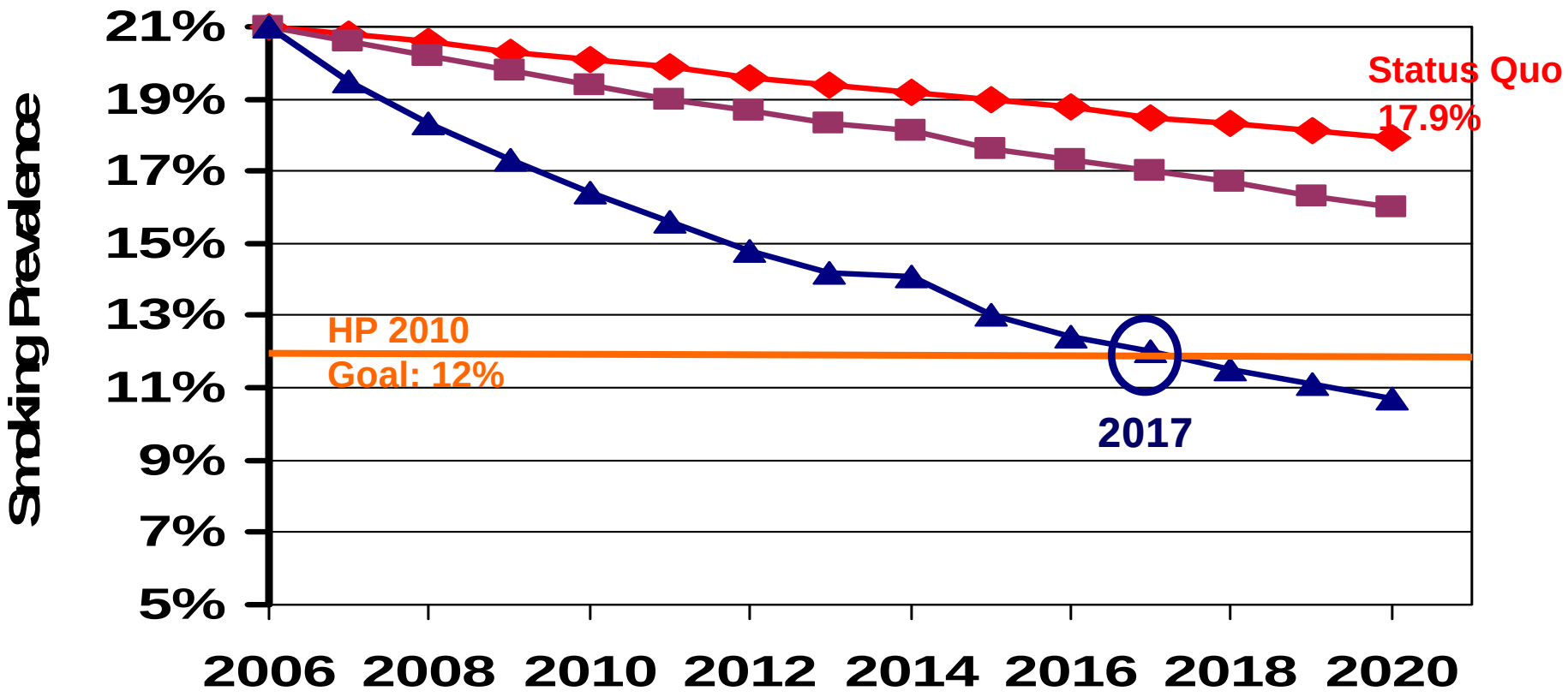
A. the number of people who make a quit attempt is increased 100% over current levels (from 40% to 80% of smokers in a given year)

__AND__

B. we double the number of people who use evidence based treatments (44% use PT, 4% use BT, and 8% use PT +BT)

Two-shot Model - "What if we could increase…?"

Quit Attempts & Use of Evidence Based Tx



Double the # smokers who use evidence based tx: 2020 prev = 16.0%

QA 80% + 2X EB tx: 2020 prev = 10.7%

One-Shot Model: Improve Long-Term Abstinence

What if ...

The number of people who stay quit after a quit attempt is increased by **50% (or 100%)** for all forms of treatment?

- from 7.5% success to 11.25% (or 15%) success for **unassisted** quitters
- from 15% success to 22.5% (or 30%) success for those using evidence based **pharmacotherapy** only
- from 15% success to 22.5% (or 30%) success for those using evidence based **behavioral therapy** only
- from 25% success to 37.5% (or 50%) success for those using evidence-based pharmacotherapy combined with evidence-based **behavioral therapy**

Three-Shot Model: Quit Attempts, Evidence-Based Treatment Use & Long-Term Abstinence

"What if"…

- The number of people who make a quit attempt is increased 100% over current levels (from 40% to 80% of smokers in a given year)

__AND__

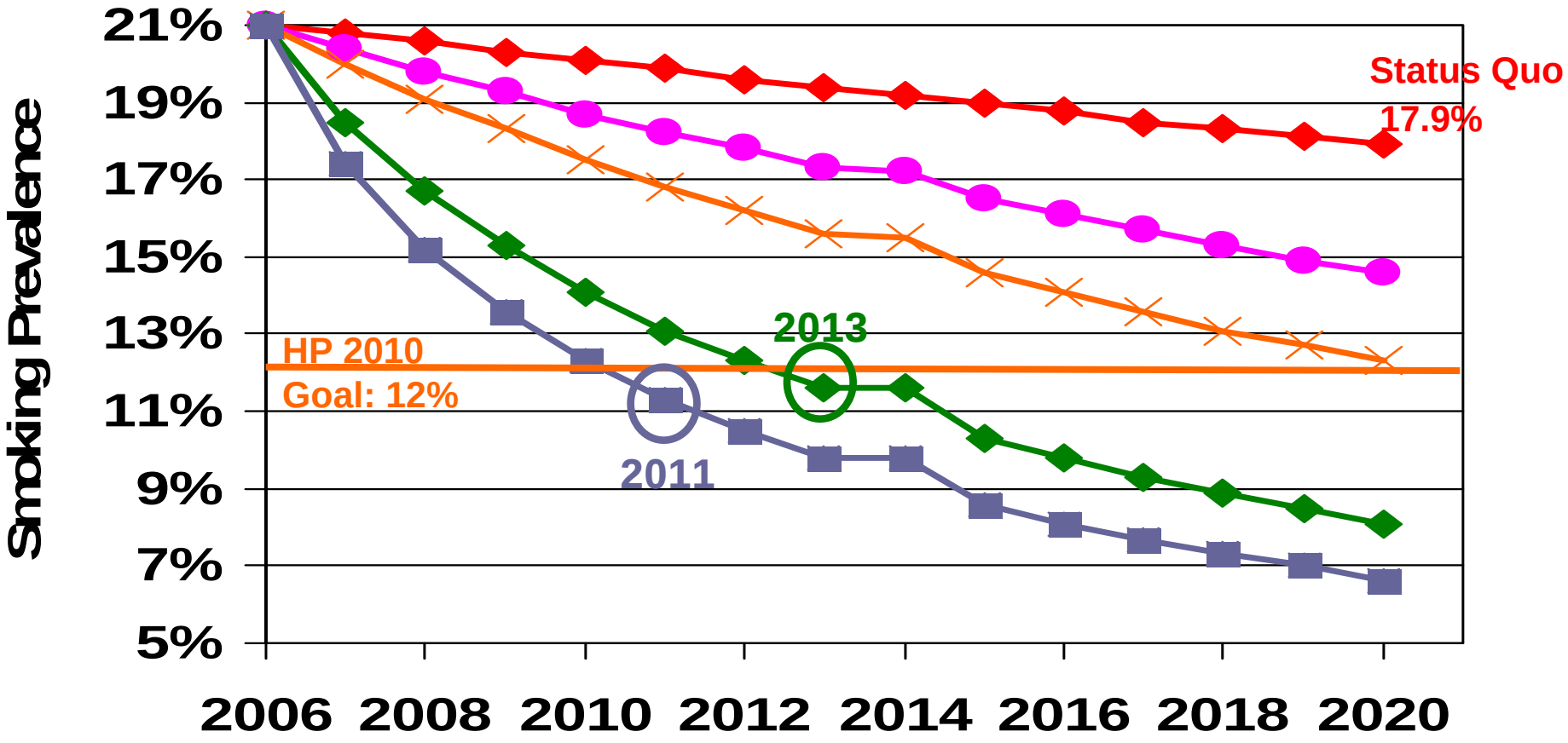
- Twice as many people use evidence based treatments (44% use PT, 4% use BT, and 8% use PT +BT)

__AND__

- The number of people who achieve long-term abstinence is increased by **50% or 100%** for all forms of treatment.

3-Shot Model - "What if we could increase…?"

Quit Attempts, E-B Tx, Long-term Abstinence



50% of quitters achieve long term abstinence: 2020 prev = 14.6%

100% of quitters achieve LTA: 2020 prev = 12.3%

3-shot - QA 80% + 2X EB tx + LTA 50%: 2020 prev = 8.1%

3-shot - QA 80% + 2X EB tx + LTA 100%: 2020 prev = 6.6%

Traditional Policies Model: Tax Increase, Clean Indoor Air, Media

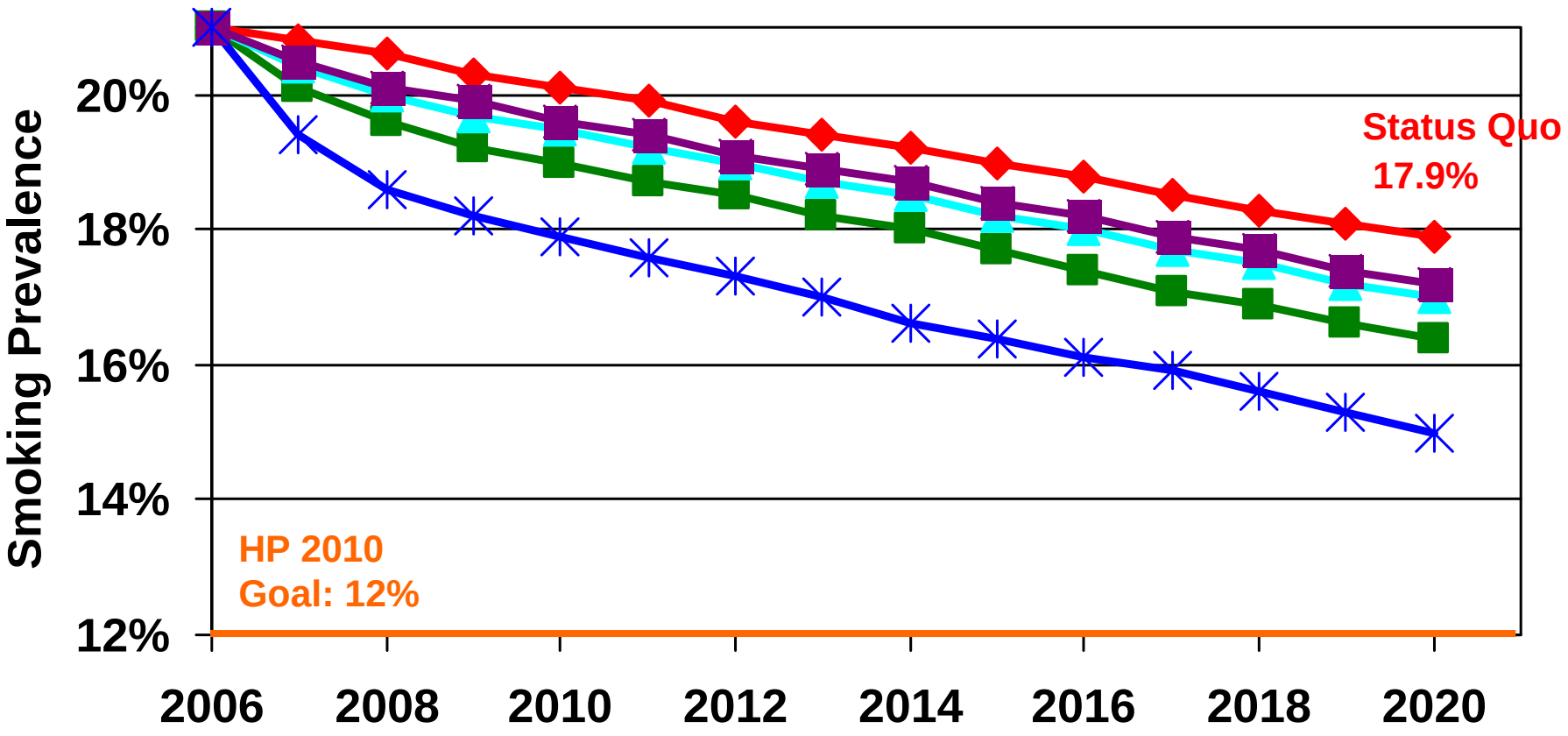
We individually consider the following policies:

- Increase taxes by $2.00 per pack in Yr 1
- Enact nationwide clean indoor air laws
- Run media campaigns to promote quitting and use of evidence-based treatments across all years (2007-2020)

Will then combine all of the above policies simultaneously

Based on previous studies of their effect on quitting behavior and prevalence. Modeled through quit attempts, with biggest effect in the first year

Traditional Tobacco Control Policies Model



Tax increase to $2.00 per pack: 2020 prev = 16.4%

Clean Indoor Air laws: 2020 prev = 17.0%

Media campaigns: 2020 prev = 17.2%

All 3 traditional policies combined: 2020 prev = 15.0%

Cessation Policies Model (adult)

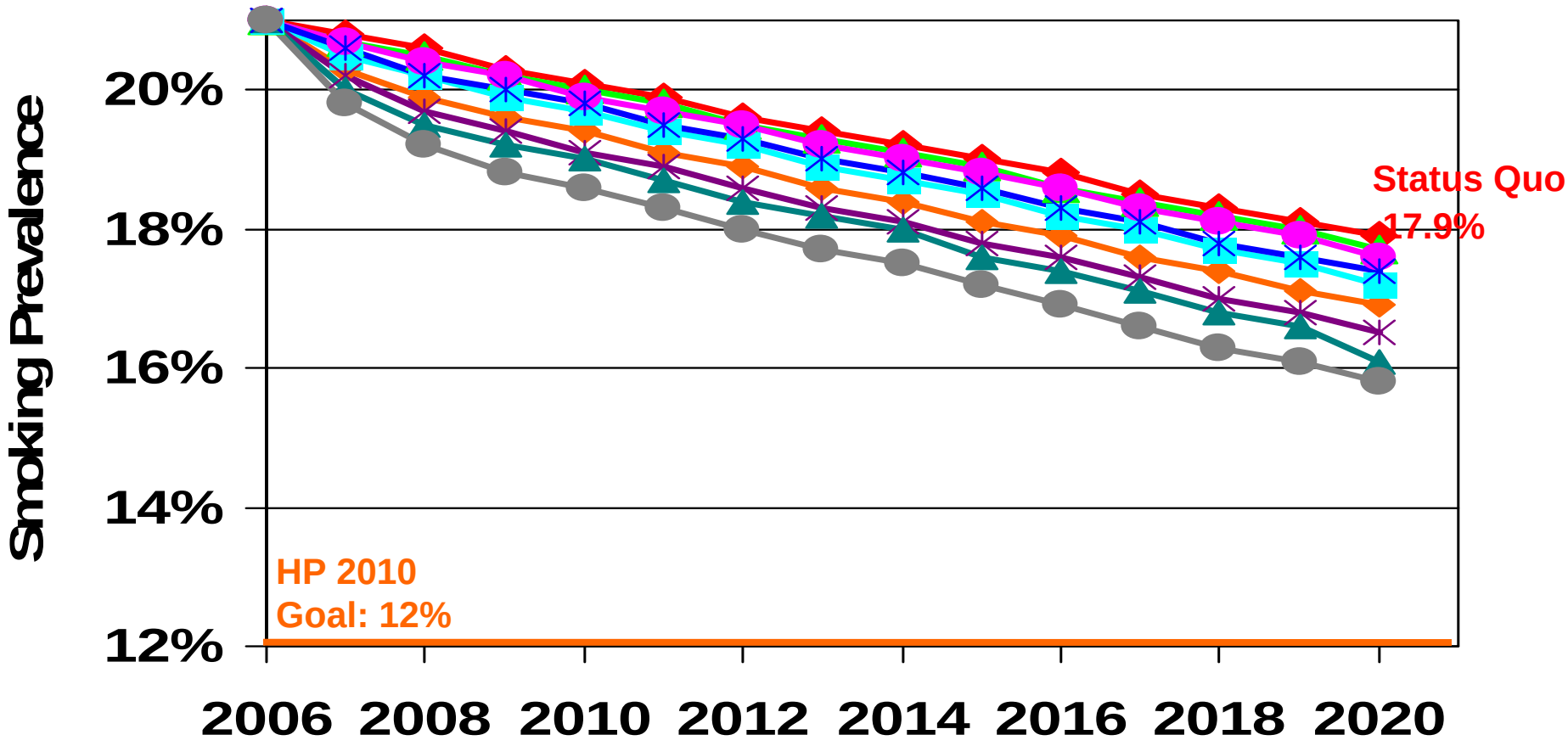
We individually consider the following interventions:

- Complete financial access to evidence based treatment (pharmacotherapy/behavioral tx)
- Proactive quitlines – free to all
- Web-based treatment – free to all
- Brief interventions – ask, advise, assist, arrange for every patient in every health care setting

We then combine, in stepwise fashion, all of the above

Based on previous studies of their effect on quitting behavior and prevalence. Modeled through quit attempts and quit success, with biggest effect in the first year

Cessation Policies Model (adult)



Complete financial access to EB tx: prev 2020 16.9%

Free proactive quitlines: 2020 prev = 17.7%

Free P-QL + free NRT: 2020 prev = 17.2%

Complete financial access + P-QL + Free NRT: 2020 prev = 16.5%

Free web-based tx: 2020 prev = 17.6%

Complete financial access + P-QL + NRT + free web tx: 2020 prev = 16.1%

Brief intervention at every health care visit: 2020 prev = 17.4%

All 5 cessation policies combined: 2020 prev = 15.8%

Full Throttle Model:
Data-driven + speculation

- Traditional tobacco control policies (all 3)

AND

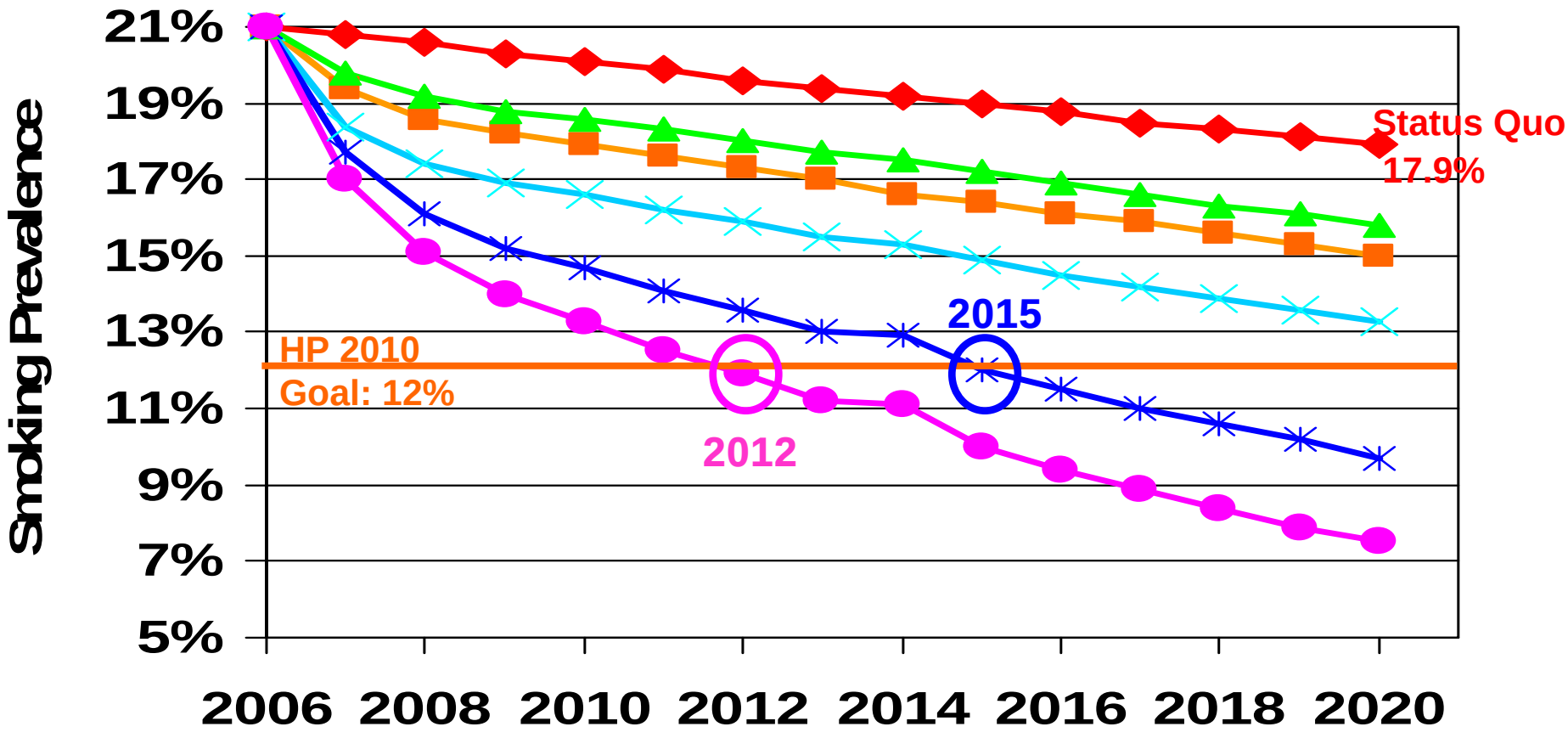
- Cessation Policies (adult, all 5)

AND

- "What if we could…":

  Increase Long-Term Abstinence Rates by 50% or 100%

Full Throttle Model:
Traditional Policies, Adult Cessation Policies, Increase LTA



$2 Taxes + Clean Indoor Air laws + Media: prev 2020 15.0%

All 5 cessation policies: prev 2020 15.8%

All 3 traditional policies + all 5 cessation policies: prev 2020 13.3%

All 8 policies + increase LTA by 50%: prev 2020 9.7%

All 8 policies + increase LTA by 100%: prev 2020 7.5%

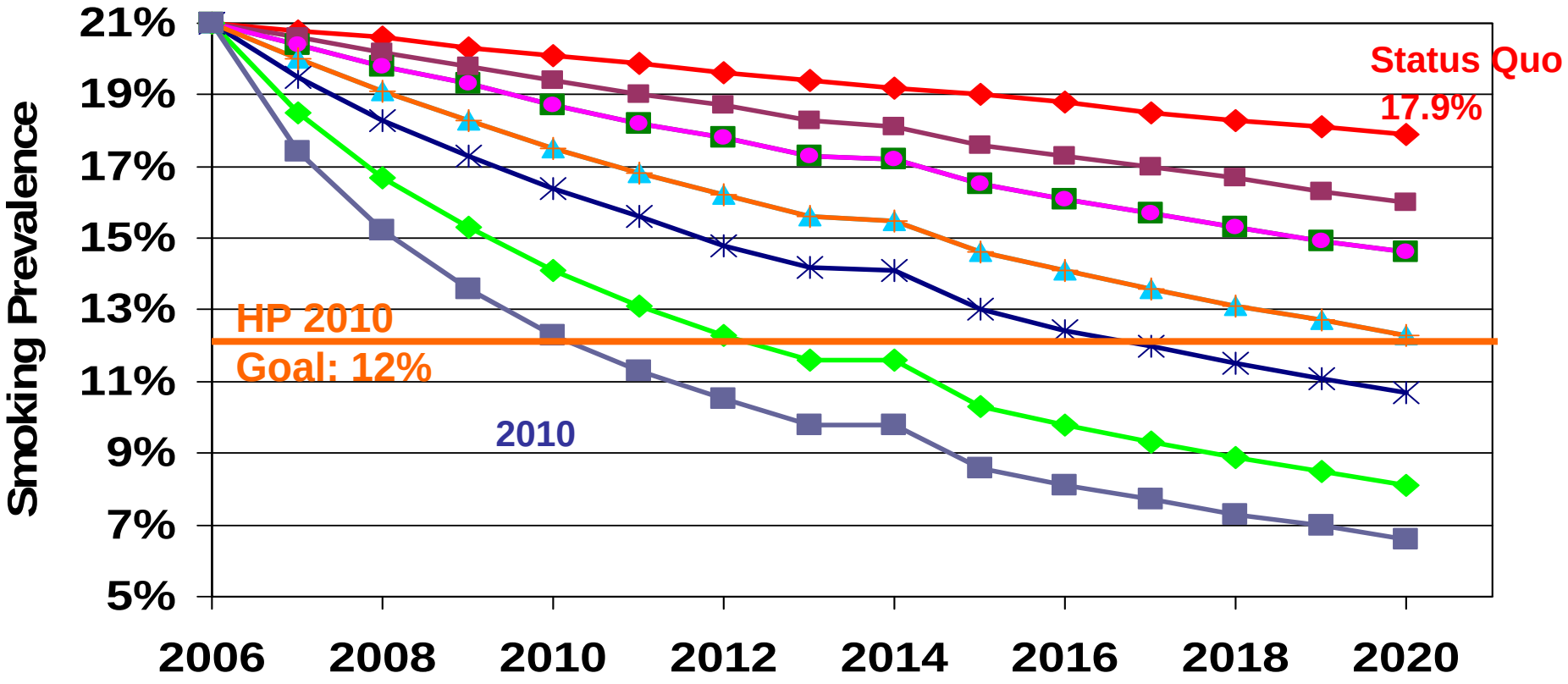
Summary

- Traditional policies alone, even if implemented today nationwide won't get us to HP 2010 goals for prevalence…even by 2020!
- But there is hope, if we can make a breakthrough and act immediately:
  - 3-shot model: dramatic increase in QA, EB tx, LTA could get us there by 2011 and to 6.6% by 2020
  - Full throttle model: traditional and cessation policies combined with increasing LTA could get us there by 2012 and to 7.5% by 2020

END

3-shot Model - Everything

Quit Attempts, Evidence-Based Tx, LTA 50/100



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