Polling

- Pull out your electronics
- Go to Pollev.com/NUCATS

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pollev.com/nucats. Do you like these live polls?
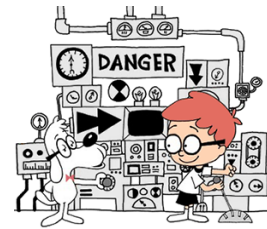
Love it **A**

Meh **B**

Yuck **C**

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What should be the topic for the next ACMI meeting?

Top

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Revisiting the 2009 AMIA Policy Summit:

Justin Starren

Warning: Interactive Session Ahead

- Strong Opinions Abound
- Lets keep it safe and civil
- Pull out your cellphones or computers

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Parts

- 2009 Redux
- Scoring our Concerns and Predictions
- Scoring our Recommendations
- Identifying missed opportunities

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AMIA
Health Policy Forum

Anticipating and Addressing
the Unintended Consequences of
Health Information Technology (HIT)
and Policy:
Report of the AMIA Policy Summit,
September 9-10, 2009, Reston VA

Meeting Co-Chairs

Nancy M. Lorenzi, PhD, MS, MA, FACMI
Professor of Biomedical Informatics, Vanderbilt University School of Medicine
and Clinical Professor of Nursing at the Vanderbilt University School of
Nursing

Justin Starren, MD, PhD, FACMI
Director, Biomedical Informatics Research Center
and Associate Medical Director for Informatics, Marshfield Clinic

AMIA Policy Summit 2009

2009 AMIA Health Policy Meeting Steering Committee

- Joan Ash (OHSU)
- David Bates (AMIA BOD Chair; Partners)
- Meryl Bloomrosen (AMIA)
- Trevor Cohen (UT)
- Richard Dykstra (OHSU)
- Nancy Lorenzi (Vanderbilt), co-chair
- Julie McGowan (Indiana)
- Vimla Patel (ASU)
- Josh Peterson (Vanderbilt)
- Vojtech Huser (Marshfield Clinic)
- Adam Wright (Brigham and Women's)
- David Pieczkiewicz (Marshfield Clinic)
- Trent Rosenbloom (Vanderbilt)
- Justin Starren (Marshfield Clinic), co-chair
- Ted Shortliffe (AMIA President and CEO)
- Freda Temple (AMIA)

AMIA Policy Summit 2009

President Obama's First Weekly Address
Saturday, January 24th, 2009

"To lower health care cost, cut medical errors, and improve care, we'll computerize the nation's health records in five years, saving billions of dollars in health care costs and countless lives."

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Stimulus Package—HITECH

- Includes ~$18 billion in spending on Medicare and Medicaid incentives for the "meaningful use" of certified EHRs

- Office of the National Coordinator (ONC) for HIT gets more status and budget ($2 billion)

- $1.1 billion to study comparative effectiveness

AMIA Policy Summit 2009

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*Never, in the history
of this country, has
Health Information Technology
been asked to do
so much,
so fast,
for so many*

AMIA Policy Summit 2009

Working Definition

- Unintended Consequences (UC) are outcomes of actions that are not originally intended in a particular situation. In a clinical domain, they can often be equated with side-effects or adverse events.

- Unintended ≠ Unanticipated

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"Quite often, good things have hurtful consequences"

- Aristotle, 384-322 B.C.

AMIA Policy Summit 2009

The best laid schemes o' Mice an' Men,
Gang aft agley,

- Robert Burns, *To a Mouse*, 1785
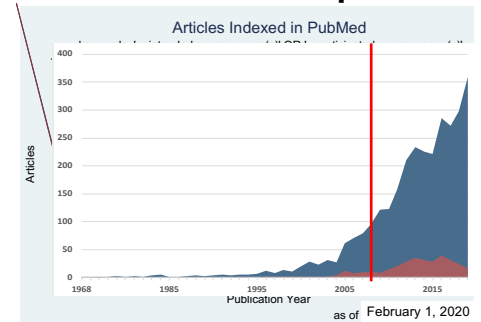
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"[Everyone is] led by an invisible hand to promote an end which was no part of his intention."

-Adam Smith, *Wealth of Nations*, 1776

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Growing Interest in Unintended Consequences

Articles Indexed in PubMed

as of February 1, 2020

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Describing Consequences

- Unintended Consequences are difficult to categorize
- Often the result of an unseen or poorly understood complex system

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Describing Consequences

- Desirability
- Anticipatability
- Direct vs. Indirect
- Type of input
- Type of consequence
- Stakeholders affected
- Magnitude of impact

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Slide 1

Describing Consequences

Desirability

- Is the outcome positive, negative or mixed (good for some, bad for others)

Desirable   Mixed   Undesirable

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Slide 2

Describing Consequences

Anticipatability

- Can such events be anticipated?

| Predictable | Experts may Predict | Anticipate with effort | Total Surprise |

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Slide 3

Describing Consequences

Direct vs. Indirect

- Does the input cause the consequence directly or is there a chain of events?

A ➡ B   A   B

Direct   Indirect

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Slide 4

Describing Consequences

Bringing it Together

Consequences of: _____

	Anticipated		Unanticipated	
	Direct	Indirect	Direct	Indirect
Desirable	*Goals*		*Serendipities*	
Undesirable	*Trade-offs*		*"Classic" Negative Unintended Consequences*	

Intended Consequences
Unintended Consequences

Slide 5

Describing Consequences

Consequences of: **CPOE**

	Anticipated		Unanticipated	
	Direct	Indirect	Direct	Indirect
Desirable	More Accurate Prescribing	Improved JCAHO Compliance	Use error checker as recommender system	Alerts become learning tool
				Change in Organizational Power Structure
Undesirable	Ordering takes more time	Some Physicians Leave	New Types of Errors	Alert fatigue

Intended Consequences
Unintended Consequences

Slide 6

Group Leaders:
   Justin Starren, MD, PhD
   Josh Peterson, MD, MPH
   Freda Temple

Technology Factors

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Technology Driven Consequences

- Data related
  - Data Overload
  - Alert fatigue
  - Decreased data quality
- User Interface issues
- Limited software methodology
- System interconnection errors
- "A system is only as good as the implementation"

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The growth of EHRs will lead to data overload by clinicians

- Chicken Little. Minimal Impact
- Moderately less than we expected
- Slightly less than we expected
- Got it about right about the magnitude
- Slightly more than we expected
- Moderately more than we expected
- Huge problem. Much worse than we expected.

Start the presentation to see live content. Still no live content? Install the app or get help at **PollEv.com/app**

Alert Fatigue will lead to patient harm.

- Chicken Little. Minimal Impact
- Moderately less than we expected
- Slightly less than we expected
- Got it about right about the magnitude
- Slightly more than we expected
- Moderately more than we expected
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Alert dependence will lead to patient harm

- Chicken Little. Minimal Impact
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- Slightly less than we expected
- Got it about right about the magnitude
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Behaviors like cut/paste will result in decreased data quality.

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- Got it about right about the magnitude
- Slightly more than we expected
- Moderately more than we expected
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Problems with System Interconnections will lead to patient harm.

- Chicken Little. Minimal Impact
- Moderately less than we expected
- Slightly less than we expected
- Got it about right about the magnitude
- Slightly more than we expected
- Moderately more than we expected
- Huge problem. Much worse than we expected.

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Slide 1:

- **Group Leaders**
  - **Vimla L. Patel, PhD, DSc**
  - **Trevor Cohen, MD, PhD**
  - **David Pieczkiewicz, PhD**

Human and Cognitive Factors

AMIA Policy Summit

Slide 2:

Usability Issues with EHRs will increase cognitive load for clinicians

- Chicken Little. Minimal Impact
- Moderately less than we expected
- Slightly less than we expected
- Got it about right about the magnitude
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- Moderately more than we expected
- Huge problem. Much worse than we expected.

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Slide 3:

- **Group Leaders**
  - **Nancy Lorenzi, PhD, MS, MA**
  - **Joan Ash, PhD, MLS, MBA**
  - **Richard Dykstra, MD**
  - **Trent Rosenbloom, MD, MPH**

Organizational Factors

AMIA Policy Summit 2009

Slide 4:

EHR Implementation Failures will occur at many organizations and lead to staff exhaustion.

- Chicken Little. Minimal Impact
- Moderately less than we expected
- Slightly less than we expected
- Got it about right about the magnitude
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Slide 5:

Limitations of current EHRs will cause staff to create a large number of work-arounds

- Chicken Little. Minimal Impact
- Moderately less than we expected
- Slightly less than we expected
- Got it about right about the magnitude
- Slightly more than we expected
- Moderately more than we expected
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Start the presentation to see live content. Still no live content? Install the app or get help at **PollEv.com/app**

Slide 6:

Organizations and Group Dynamics

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Contract restrictions and other fears will result in organizations not sharing critical information and lessons learned.

Chicken Little. Minimal Impact

Moderately less than we expected

Slightly less than we expected

Got it about right about the magnitude

Slightly more than we expected

Moderately more than we expected

Huge problem. Much worse than we expected.

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- **Group Leaders**
  - **Edward H. Shortliffe, MD, PhD**
  - **David M. Bates, MD, MSc**
  - **Julie McGowan, PhD**
  - **Adam Wright, PhD**
  - **Doug Peddicord, PhD**
  - **Vojtech Huser, MD, PhD**
  - **Ebele Okwumabua**

Fiscal and Regulatory Issues

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Increased regulation will create barriers to entry and reduce innovation

Chicken Little. Minimal Impact

Moderately less than we expected

Slightly less than we expected

Got it about right about the magnitude

Slightly more than we expected

Moderately more than we expected

Huge problem. Much worse than we expected.

Start the presentation to see live content. Still no live content? Install the app or get help at **PollEv.com/app**

Widespread availability of EHRs will increase fraud and abuse.

Chicken Little. Minimal Impact

Moderately less than we expected

Slightly less than we expected

Got it about right about the magnitude

Slightly more than we expected

Moderately more than we expected

Huge problem. Much worse than we expected.

Start the presentation to see live content. Still no live content? Install the app or get help at **PollEv.com/app**

Patient and Provider Identity Theft will be a significant problem

Chicken Little. Minimal Impact

Moderately less than we expected

Slightly less than we expected

Got it about right about the magnitude

Slightly more than we expected

Moderately more than we expected

Huge problem. Much worse than we expected.

Start the presentation to see live content. Still no live content? Install the app or get help at **PollEv.com/app**

Push to adopt EHRs will lead to early retirements of clinicians

Chicken Little. Minimal Impact

Moderately less than we expected

Slightly less than we expected

Got it about right about the magnitude

Slightly more than we expected

Moderately more than we expected

Huge problem. Much worse than we expected.

Start the presentation to see live content. Still no live content? Install the app or get help at **PollEv.com/app**

EHR Adoption will lead to increased use of "physician extenders"

Chicken Little. Minimal Impact

Moderately less than we expected

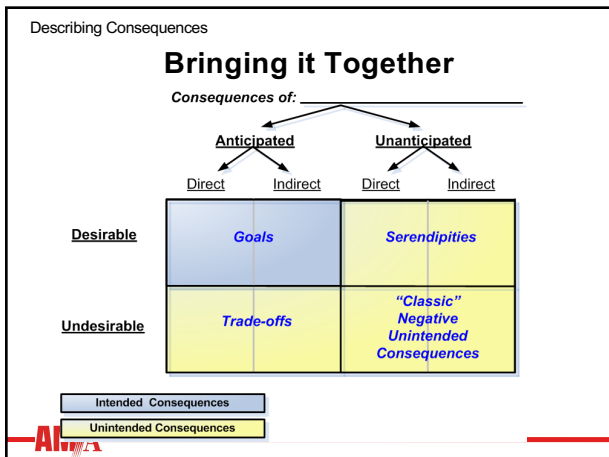Slightly less than we expected

Got it about right about the magnitude

Slightly more than we expected

Moderately more than we expected

Huge problem. Much worse than we expected.

Start the presentation to see live content. Still no live content? Install the app or get help at **PollEv.com/app**

There will be an increase in documentation and reporting requirements

Chicken Little. Minimal Impact

Moderately less than we expected
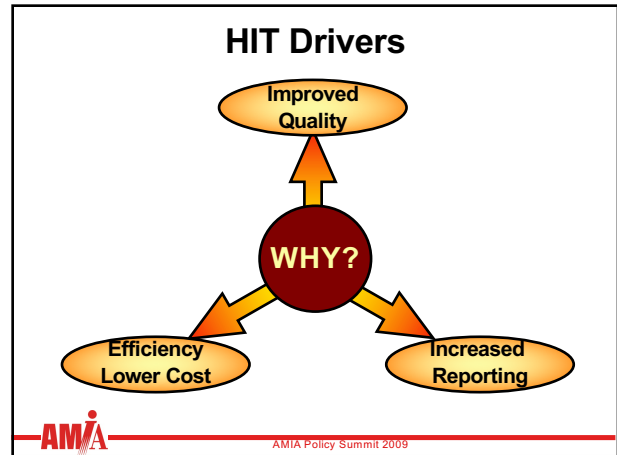
Slightly less than we expected

Got it about right about the magnitude

Slightly more than we expected

Moderately more than we expected

Huge problem. Much worse than we expected.

Start the presentation to see live content. Still no live content? Install the app or get help at **PollEv.com/app**

False positives from abuse and fraud detection algorithms will harm clinicians and/or patients

Chicken Little. Minimal Impact

Moderately less than we expected

Slightly less than we expected

Got it about right about the magnitude

Slightly more than we expected

Moderately more than we expected

Huge problem. Much worse than we expected.

Start the presentation to see live content. Still no live content? Install the app or get help at **PollEv.com/app**

HIT Drivers

Improved Quality

WHY?

Efficiency Lower Cost

Increased Reporting

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Describing Consequences

Bringing it Together

Consequences of:

Anticipated **Unanticipated**

Direct Indirect Direct Indirect

Desirable | *Goals* | *Serendipities*

Undesirable | *Trade-offs* | *"Classic" Negative Unintended Consequences*

Intended Consequences

Unintended Consequences

AMIA

Is the current burnout crisis a direct or indirect consequence of the adoption of EHRs

Directly caused by EHRs

Mix of direct and indirect effects

Indirectly caused by EHRs.

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Was the current burnout crisis anticipatable?

Totally obvious to everyone this would happen

The experts saw this coming, other did not

Had we worked harder, we could have anticipated this

Total surprise. This was not predictable.

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We predicted the scale of the current burnout crisis coming?

Chicken Little. There is no burnout crisis

Moderately less than we expected

Slightly less than we expected

Got it about right about the magnitude

Slightly more than we expected

Moderately more than we expected

Huge problem. Much worse than we expected.

Start the presentation to see live content. Still no live content? Install the app or get help at **PollEv.com/app**

How much to EHRs contribute to the current burnout crisis?

0-10% Minimal Impact. It is caused by other factors

11-40%. Less than half of the contribution to the problem

41-60%. Roughly half of the problem

61-90%. The majority of the problem is caused by EHRs.

91-100%. Without EHRs there would be no burnout crisis.

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Recommendations

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Research Agenda

- **Create a taxonomy related to unintended consequences of HIT implementations.**
- **Conduct research to improve the ability to identify, anticipate, and avoid/mitigate unintended consequences.**
  - The implementation of complex HIT in complex healthcare organizations remains too much an art and too little a science.
- **Conduct additional cognitive research on the relationship of HIT system design to unintended consequences.**
  - Current knowledge is insufficient to accurately predict adverse cognitive consequences.
- **Determine and disseminate best practices for HIT design**.
  - Synthesize existing and future studies to capture, compile, and disseminate best practices and guidelines for designing and implementing HIT systems.
- **Determine and disseminate optimal organizational strategies for HIT system implementation.**
  - The complexity of the healthcare workflow makes it resistant to conventional workflow modeling and automation approaches.

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Research Recommendation: Create a taxonomy related to unintended consequences of HIT implementations.

No significant action on this recommendation

Some small amount of work

About half way there

Largely responded to.

We are done. Check it off.

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9

Research Recommendation: Conduct research to improve the ability to identify, anticipate, and avoid/mitigate unintended consequences.

No significant action on this recommendation

Some small amount of work

About half way there

Largely responded to.

We are done. Check it off.

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Research Recommendation: Conduct additional cognitive research on the relationship of HIT system design to unintended consequences.

No significant action on this recommendation

Some small amount of work

About half way there

Largely responded to.

We are done. Check it off.

Start the presentation to see live content. Still no live content? Install the app or get help at **PollEv.com/app**

Research Recommendation: Determine and disseminate best practices for HIT design.

No significant action on this recommendation

Some small amount of work

About half way there

Largely responded to.

We are done. Check it off.

Start the presentation to see live content. Still no live content? Install the app or get help at **PollEv.com/app**

Research Recommendation: Determine and disseminate optimal organizational strategies for HIT system implementation.

No significant action on this recommendation

Some small amount of work

About half way there

Largely responded to.

We are done. Check it off.

Start the presentation to see live content. Still no live content? Install the app or get help at **PollEv.com/app**

Recommendation: Develop a framework for sharing of experiences and near misses (e.g. Aviation Safety Reporting System)

No significant action on this recommendation

Some small amount of work

About half way there

Largely responded to.

We are done. Check it off.

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Recommendations for Federal Government

- **Acknowledge the role and limitations of HIT**.
  - Avoid fostering either a "technology for technology's sake," attitude, or a belief that technology will somehow "fix" all of the healthcare systems ills.
- **CER studies of HIT systems and implementations**.
  - Resources should be allocated to develop and implement the critical evaluative efforts noted above for systems purchased with ARRA-designated funds.
- **Identify and analyze effects of HIT-related policies**.
  - Funding is needed to support research aimed at understanding the benefits and risks of these policies with resources provided to support rigorous monitoring and evaluation mechanisms that help determine whether HIT meaningful use program goals are achieved or whether unintended consequences result
- **Promote additional information dissemination.**
  - Federal leadership to create incentives so that organizations will be more willing and able to share information.

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Govt. Recommendation: Acknowledge the limitations of HIT. Avoid belief that technology will somehow "fix" healthcare systems ills.

No significant action on this recommendation

Some small amount of work

About half way there

Largely responded to.

We are done. Check it off.

Start the presentation to see live content. Still no live content? Install the app or get help at **PollEv.com/app**

Govt. Recommendation: Support CER studies of HIT systems and implementations

No significant action on this recommendation

Some small amount of work

About half way there

Largely responded to.

We are done. Check it off.

Start the presentation to see live content. Still no live content? Install the app or get help at **PollEv.com/app**

Govt. Recommendation: Fund research aimed at understanding the benefits and risks of government's HIT policies

No significant action on this recommendation

Some small amount of work

About half way there

Largely responded to.

We are done. Check it off.

Start the presentation to see live content. Still no live content? Install the app or get help at **PollEv.com/app**

Govt. Recommendation: Federal leadership to create incentives so that organizations will be more willing and able to share information

No significant action on this recommendation

Some small amount of work

About half way there

Largely responded to.

We are done. Check it off.

Start the presentation to see live content. Still no live content? Install the app or get help at **PollEv.com/app**

**Recommendations for
Regulation and Certification**

- **Reconcile multiple EMR certifications to eliminate conflicts**
- **Implementations could be accredited by a standards-organization like JCAHO**
- **Federal Government should create a framework and designate official groups to help ensure the safety and effectiveness of HIT systems.**
  - Local oversight of HIT use is likely not sufficient
  - Lead in the development of procedures, systems and entities to ensure the safe and effective use of HIT.
  - A rush to formal FDA regulation of HIT as a medical device would be premature and ill-advised.

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Regulatory Recommendation: Reconcile multiple EMR certifications to eliminate conflicts

No significant action on this recommendation

Some small amount of work

About half way there

Largely responded to.

We are done. Check it off.

Start the presentation to see live content. Still no live content? Install the app or get help at **PollEv.com/app**

Regulatory Recommendation: EHR Implementations accredited by a standards-organization like JCAHO

No significant action on this recommendation

Some small amount of work

About half way there

Largely responded to.

We are done. Check it off.

Regulatory Recommendation: Avoid a rush to FDA regulation of HIT as a medical

No significant action on this recommendation

Some small amount of work

About half way there

Largely responded to.

We are done. Check it off.

Recommendations for AMIA

- Need more interaction with, and education of, attorneys who too often over-interpret or provide the strictest possible interpretation of rules
- Responses to government about problems with legislation or rules must come across as helpful, educational, and oriented toward the public good (not as lobbying for our constituency)
  – AMIA needs to be more explicit that one of our purposes is to identify and educate regarding unintended consequences of policy and financial incentives
  – Model legislation?

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AMIA Recommendation: More interaction with, and education of, attorneys who often over-interpret rules

No significant action on this recommendation

Some small amount of work

About half way there

Largely responded to.

We are done. Check it off.

AMIA Recommendation: Responses to government about legislation or rules must come across as helpful, educational, and oriented toward the public good (not as lobbying for our constituency)

No significant action on this recommendation

Some small amount of work

About half way there

Largely responded to.

We are done. Check it off.

What did we miss or not see coming?

Top

We are done!

Thanks!

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