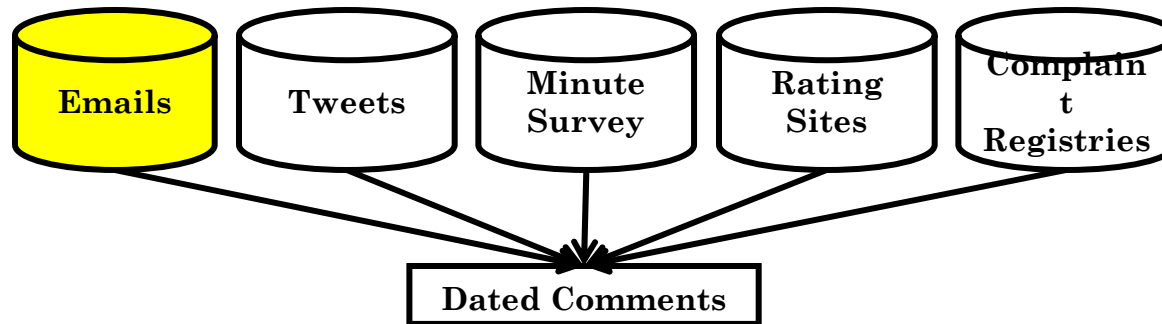# IMPROVING IN WEB SPEED: SENTIMENT ANALYSIS

Farrokh Alemi, Ph.D.
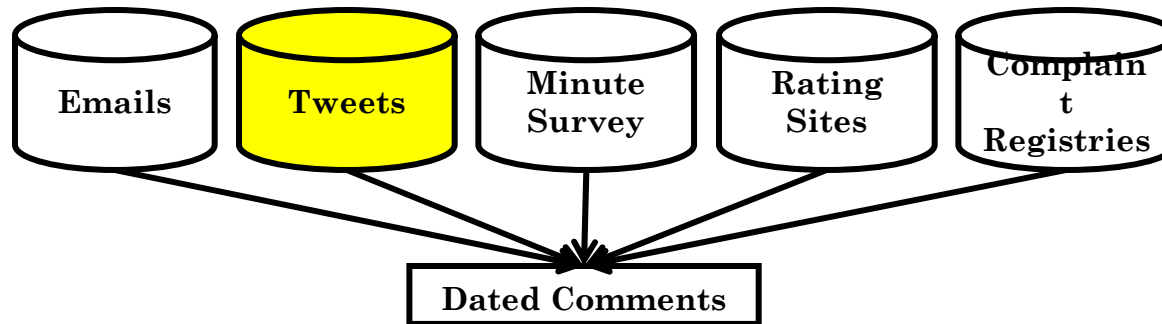
PATIENTS COMMENTS COME FROM DIFFERENT SOURCES

Ever think what is the use of Gmail?

PATIENTS COMMENTS COME FROM DIFFERENT SOURCES

| Emails | Tweets | Minute Survey | Rating Sites | Complaint Registries |

Dated Comments

DocLoop™ *The Ultimate Health Resource.*™

| Welcome | Doctors | About Us | Contact Us |

Dr. Geoffrey Ayre-Smith
★★★★☆ (1 review)

Gender: Male
Specialty: Radiology
Location: Oxnard, CA

Staff	★★★★★
Facilities	★★★★☆
Knowledge	★★★★★
Helpful	★★★★★
Value	★★★☆☆

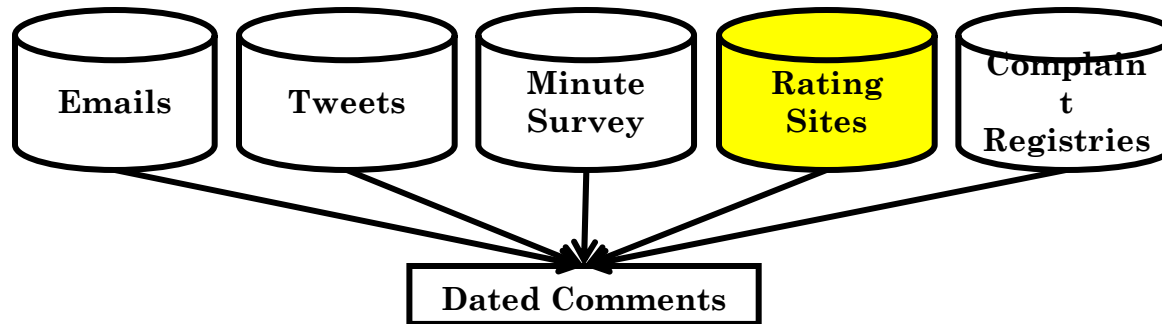**A good Radiologist - I would recommend him and his staff and expertise...**, Oct 11, 2010

I made brief contact with this physician after my mammogram. He showed me the films, and explained everything. I have never had this degree of service before. His office staff were very kind and gentle, and helped me through this test which I hate to have.
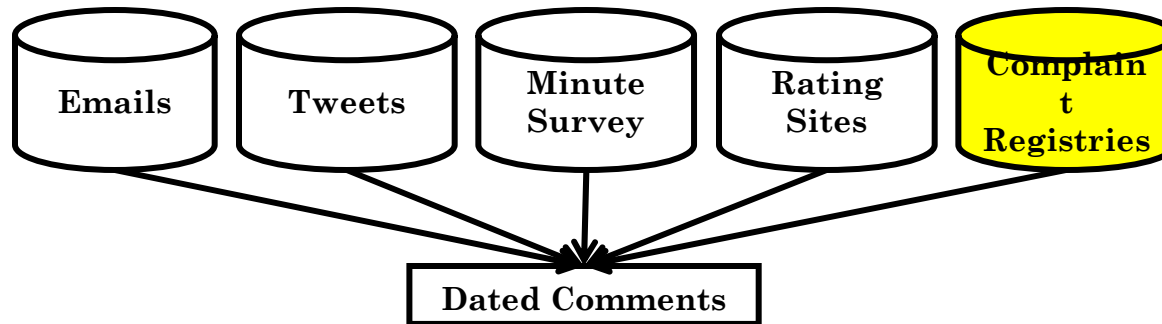
PATIENTS COMMENTS COME FROM DIFFERENT SOURCES

Emails   Tweets   **Minute Survey**   Rating Sites   Complaint Registries

Dated Comments

Rating question

This is a two part survey. In the first part you indicate your satisfaction. In the second part, and if necessary, we will contact you to ask for more details.

Your responses are confidential and shared with your provider when averaged with responses from others.

Participation in this survey is voluntary.

Visit Code 1730107

Location Code US

(1) Were you satisfied with your care?

☑ Exceeded my expectations
☐ Satisfied
☐ Not sure
☐ Dissatisfied
☐ Did not meet my minimum expectations

(2) What worked well or needed improvement:

Very prompt & friendly service!

Open ended question

Two Questions   Short Survey   Ask Everyone   High Response Rate

PATIENTS COMMENTS COME FROM DIFFERENT SOURCES

| Emails | Tweets | Minute Survey | Rating Sites | Complaint Registries |

Dated Comments

PATIENTS COMMENTS COME FROM DIFFERENT SOURCES

Emails	Tweets	Minute Survey	Rating Sites	Complaint Registries

Dated Comments

STATE AND CONSUMER SERVICES AGENCY - *Department of Consumer Affairs*   Arnold Schwarzenegger, *Governor*

MEDICAL BOARD OF CALIFORNIA
Executive Office

October 12, 2009

Barlow Smith, M.D.
1811A Highway 281, #8
Marble Falls, TX 78654-4313

RE: Physician's and Surgeon's Certificate No. G-35320
   Case No. 16-2009-201531

Public Letter of Reprimand

On June 29, 2009, the Texas Medical Board issued an Agreed Order against your medical license which resulted in a Public Reprimand and required you to complete a professional boundaries course and the pay a $3,000 administrative penalty. The Texas Medical Board found that you, a board certified psychiatrist, committed unprofessional and/or dishonorable conduct by having repeated sexual contact with a former psychiatric patient who had a history of sexual abuse and for failure to maintain the confidentiality of the patient by revealing this patient's information to your fiancé. These actions are in violation of California Business and Professions Code sections 141(a), 2234 and 2305.

Pursuant to the authority of the California Business and Professions Code section 2233, you are hereby issued this Public Letter of Reprimand by the Medical Board of California.
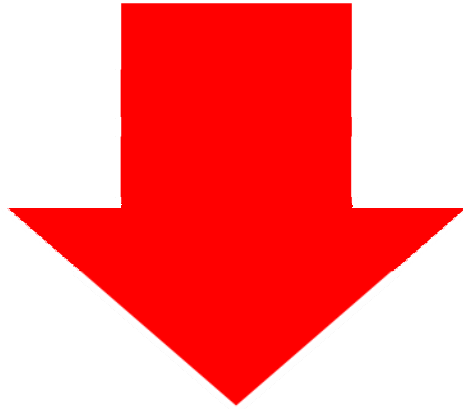
Barbara Johnston
Executive Director

PATIENTS COMMENTS COME FROM DIFFERENT SOURCES

| Emails | Tweets | Minute Survey | Rating Sites | Complaint Registries |
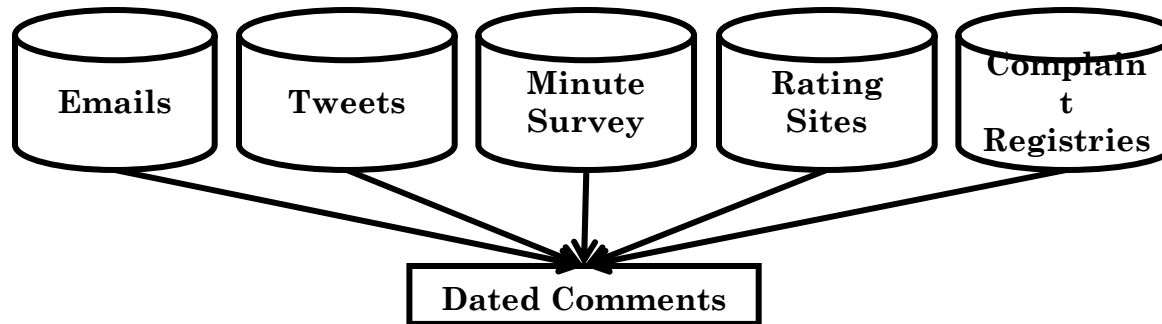
Dated Comments

An avalanche of comments, waiting to be analyzed
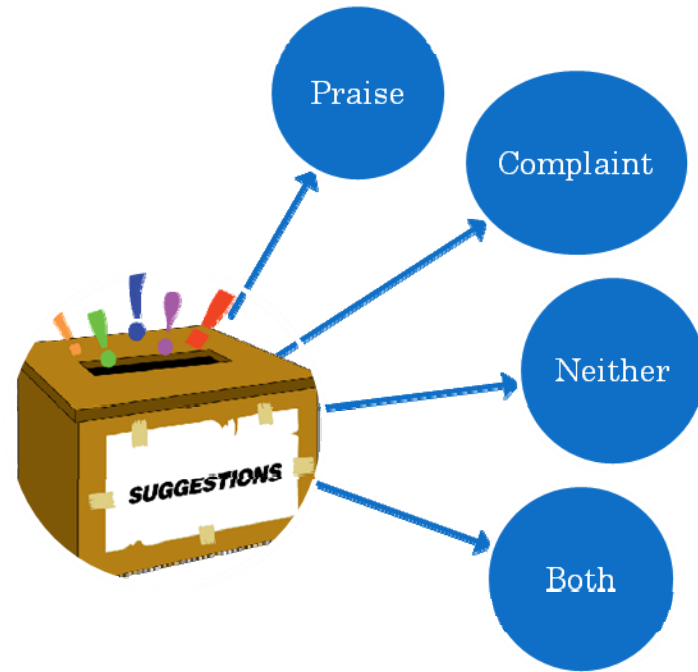
Here are some examples of praises

and complaints for Dr. Kenneth Blank in DC

COMMENTS ON DR. KENNETH BLANK

- On Oct 09:
  - Dr. Blank is fine. His staff, however, is horrific.
- On Sep 09:
  - Dr. Blank is just absolutely phenomenal. He is truly an outstanding gynecologist.
- On Mar 09:
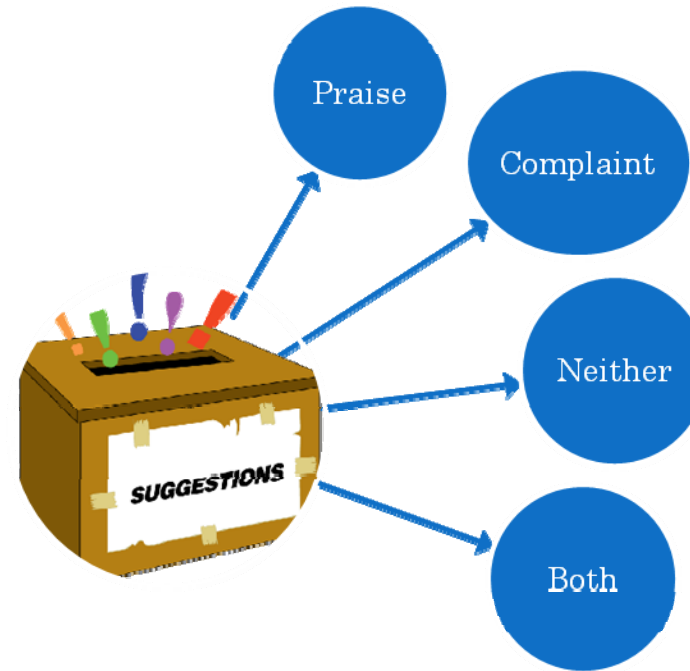 - He is kind, intelligent and thorough in his profession.

SENTIMENT ANALYSIS CLASSIFIES COMMENTS
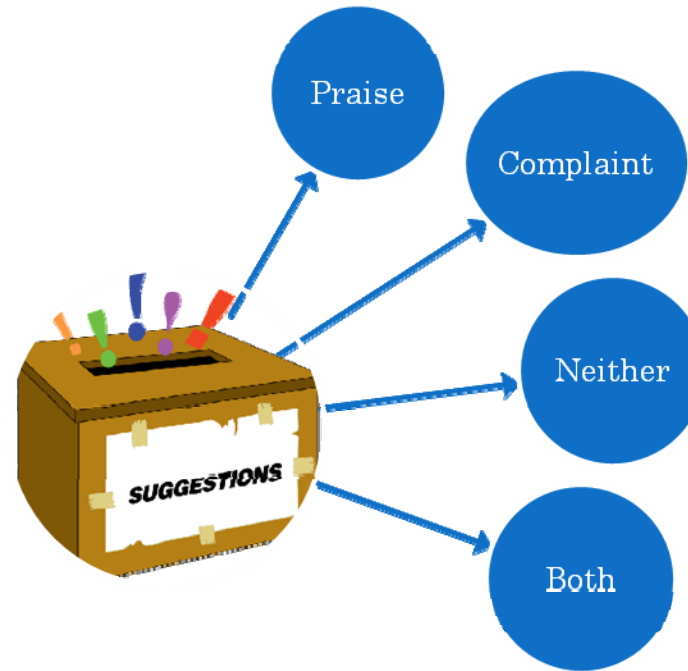
Praise

Complaint

Neither

Both

SUGGESTIONS
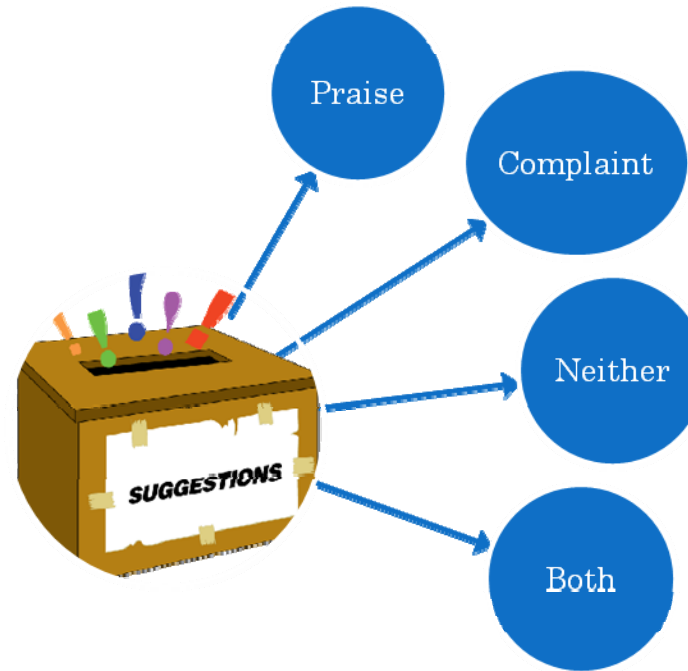
SENTIMENT ANALYSIS CLASSIFIES COMMENTS

Dr. Blank is fine.
His staff, however,
is horrific.

SENTIMENT ANALYSIS CLASSIFIES COMMENTS

Dr. Blank is fine.
His staff, however,
is **horrific**.

Praise

Complaint

Neither

Both

SUGGESTIONS

SENTIMENT ANALYSIS CLASSIFIES COMMENTS

Dr. Blank is fine.
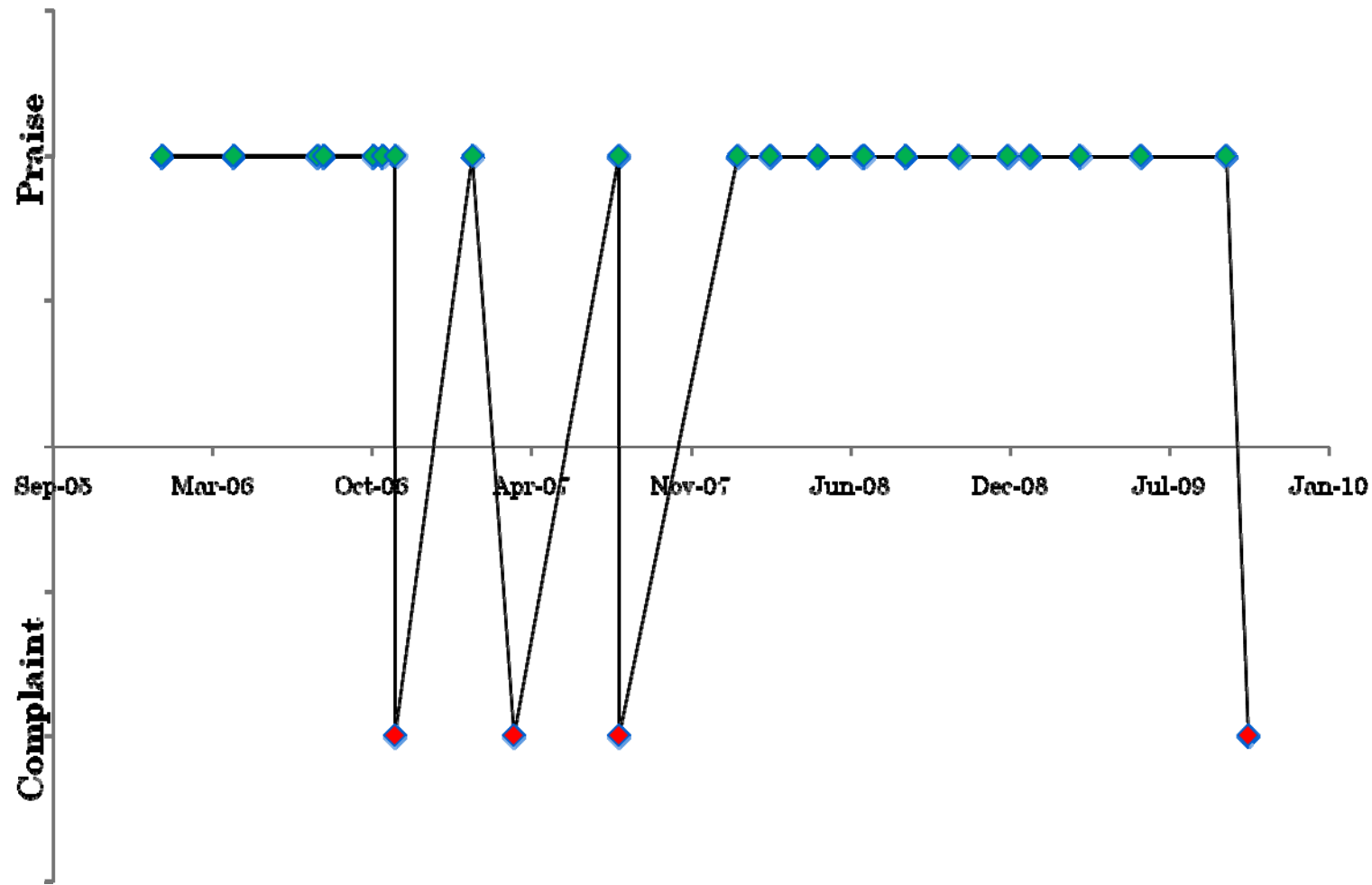His staff, however,
is **horrific**.

LIVE EXAMPLE

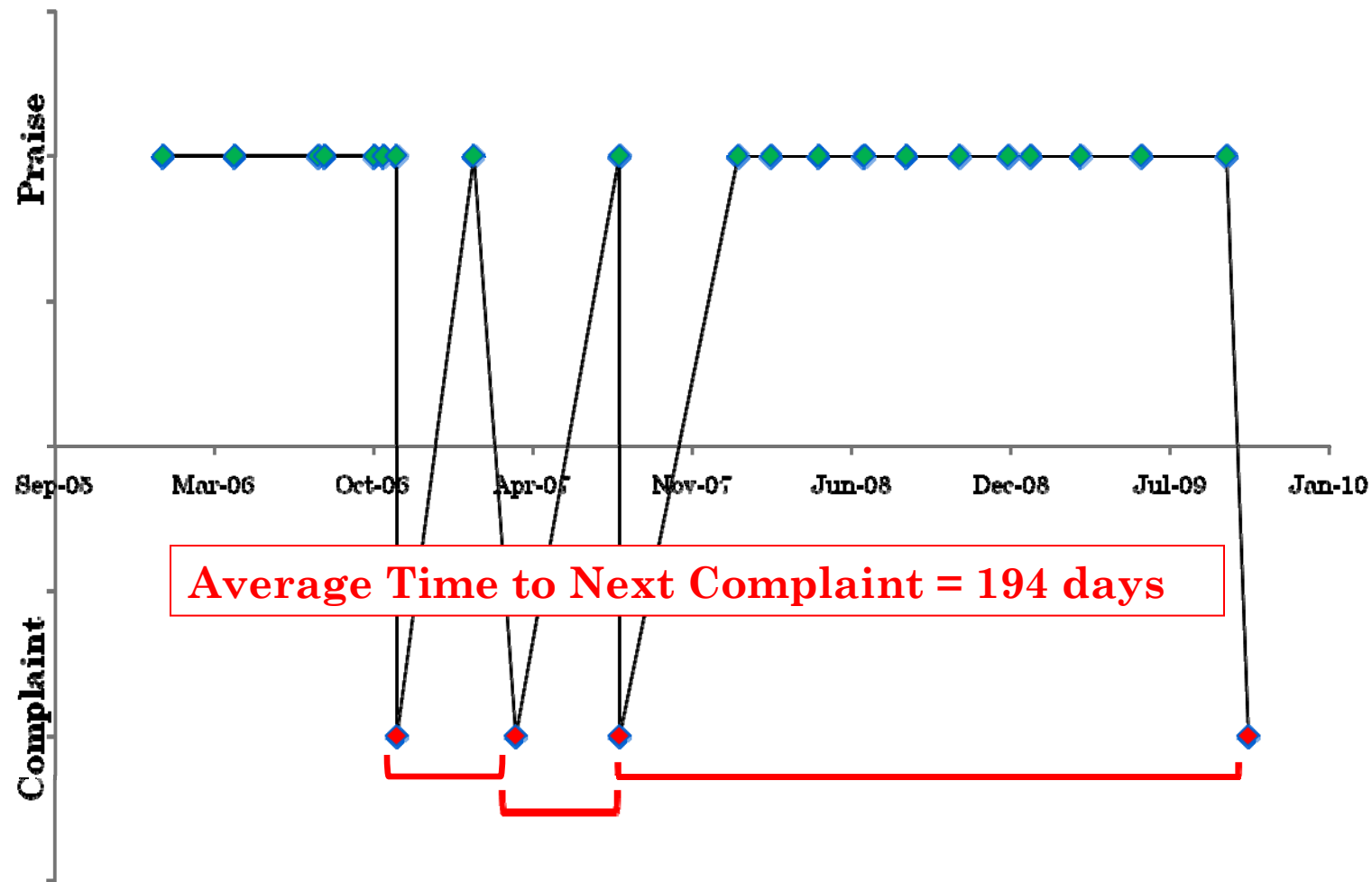# TIME-TO-NEXT COMPLAINTS PROVIDES BENCHMARKED PERFORMANCE REPORTS

CASE OF DR. KENNETH BLANK

Data obtained from Rate Your MD web site on 3/23/2009

CASE OF DR. KENNETH BLANK

Average Time to Next Complaint = 194 days

Data obtained from Rate Your MD web site on 3/23/2009

TEN BEST OB/GYN IN DC

Bar chart titled "Average Days till Next Complaint"

Physicians (top to bottom):
- Dr. Robert Footer
- Dr. Janet Schaffel
- Dr. Bruce Bonn
- Dr. Nancy Sanders
- Dr. Marciana Wilkerson
- Dr. Malcom Desouza
- Dr. Deena Kleinerman
- Dr. Willard Barnes
- Dr. George Samman
- Dr. Richard Beckerman

35 other physicians

Data obtained from Rate Your MD web site on 3/23/2009. Five years of data included.

TEN BEST OB/GYN IN DC

Dr. Robert Footer
Dr. Janet Schaffel
Dr. Bruce Bonn
Dr. Nancy Sanders
Dr. Marciana Wilkerson
Dr. Malcom Desouza
Dr. Deena Kleinerman
Dr. Willard Barnes
Dr. George Samman
Dr. Richard Beckerman

Real names

35 other physicians

Average Days till Next Complaint

TEN BEST OB/GYN IN DC

Dr. Robert Footer
Dr. Janet Schaffel
Dr. Bruce Bonn
Dr. Nancy Sanders
Dr. Marciana Wilkerson
Dr. Malcom Desouza
Dr. Deena Kleinerman
Dr. Willard Barnes
Dr. George Samman
Dr. Richard Beckerman

35 other physicians

No complaints
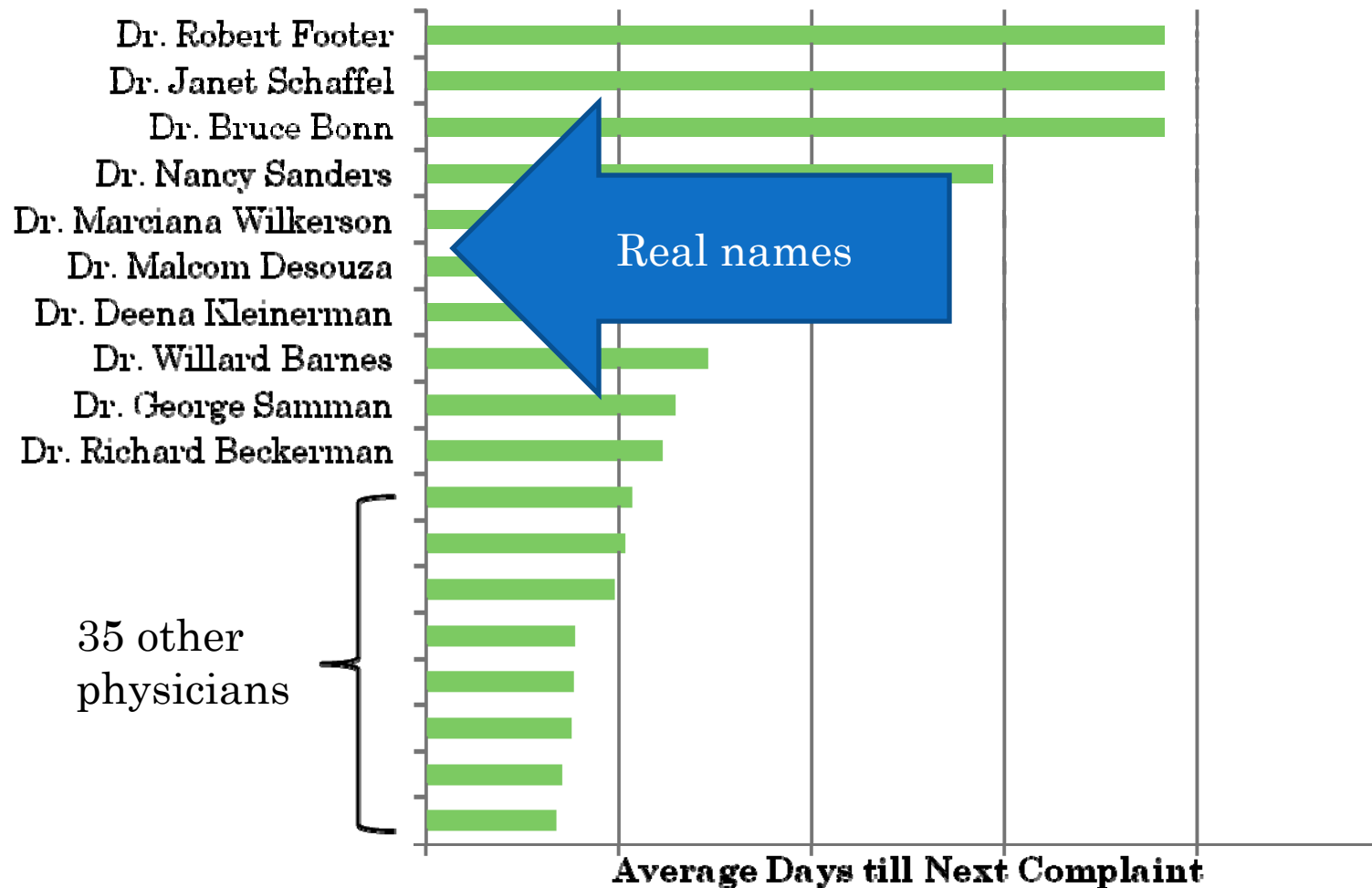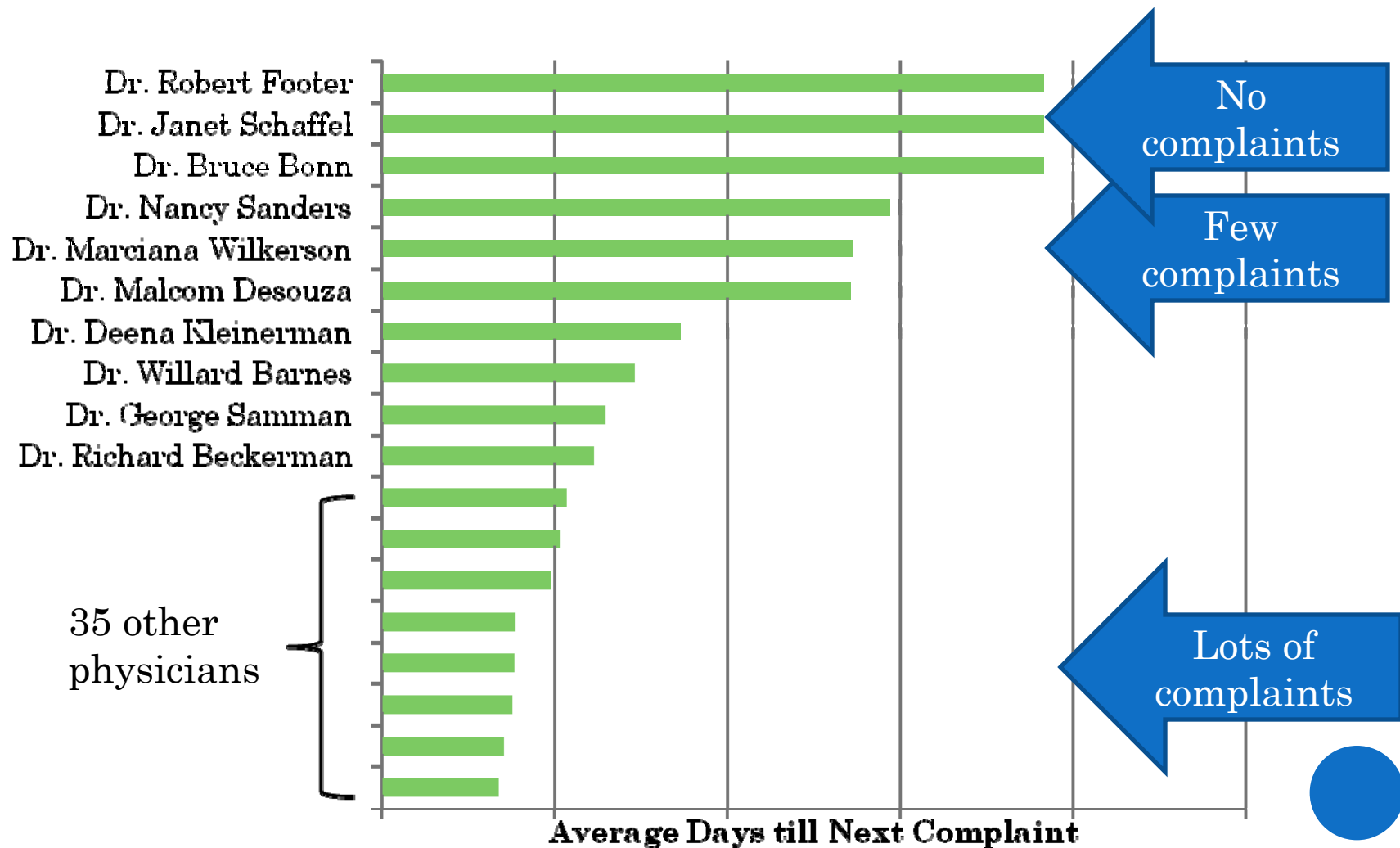
Few complaints
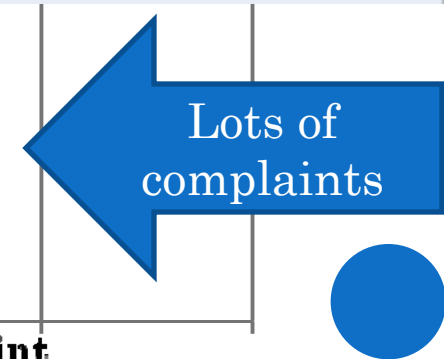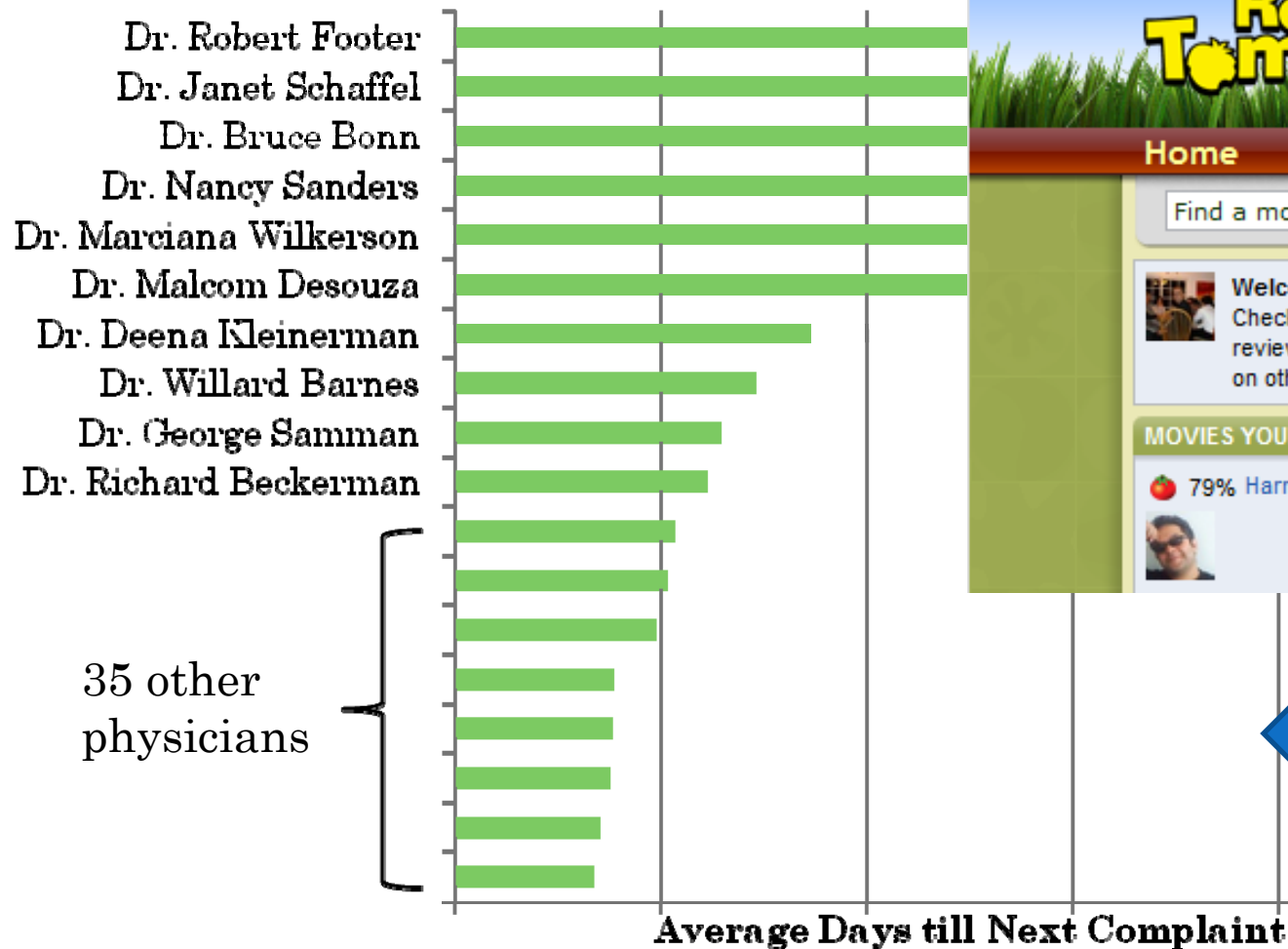
Lots of complaints

Average Days till Next Complaint

Data obtained from Rate Your MD web site on 3/23/2009. Five years of data included.

TEN BEST OB/GYN IN DC

Dr. Robert Footer
Dr. Janet Schaffel
Dr. Bruce Bonn
Dr. Nancy Sanders
Dr. Marciana Wilkerson
Dr. Malcom Desouza
Dr. Deena Kleinerman
Dr. Willard Barnes
Dr. George Samman
Dr. Richard Beckerman

35 other physicians

Average Days till Next Complaint

Lots of complaints

Average Days to Next Complaint for VA OBGYN's

Doc. # 64
349.2 Days to Next Complaint
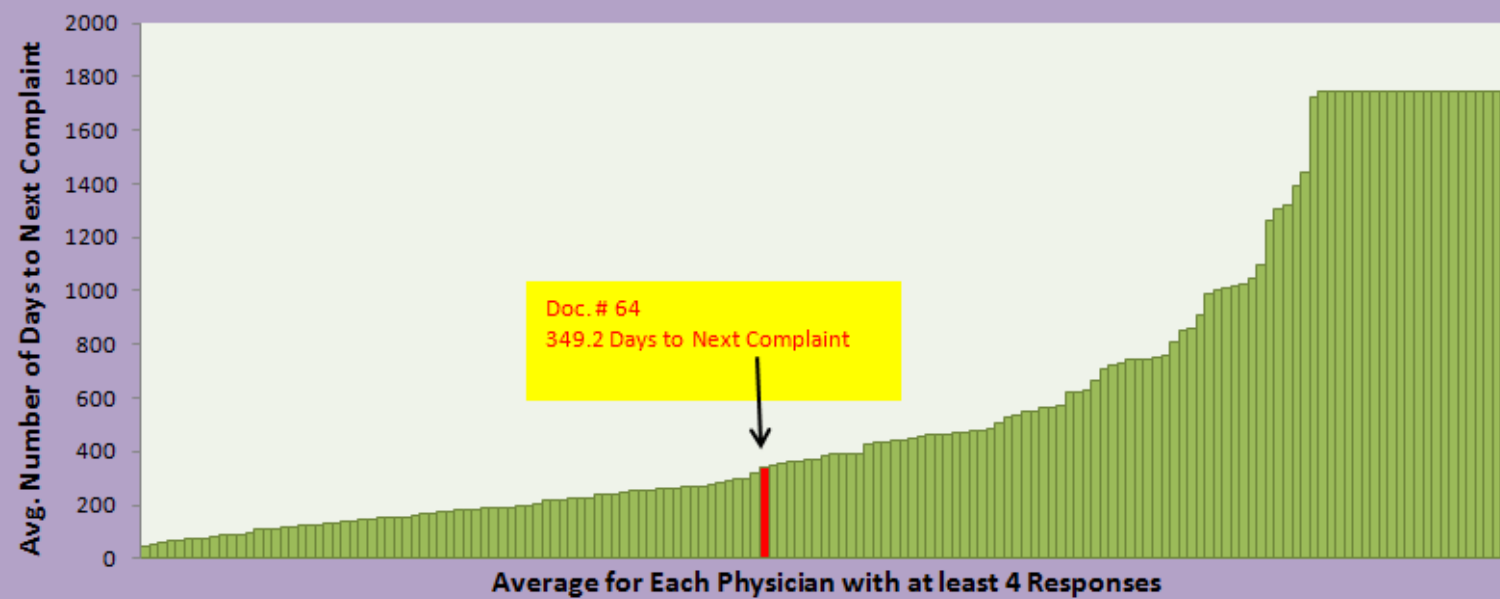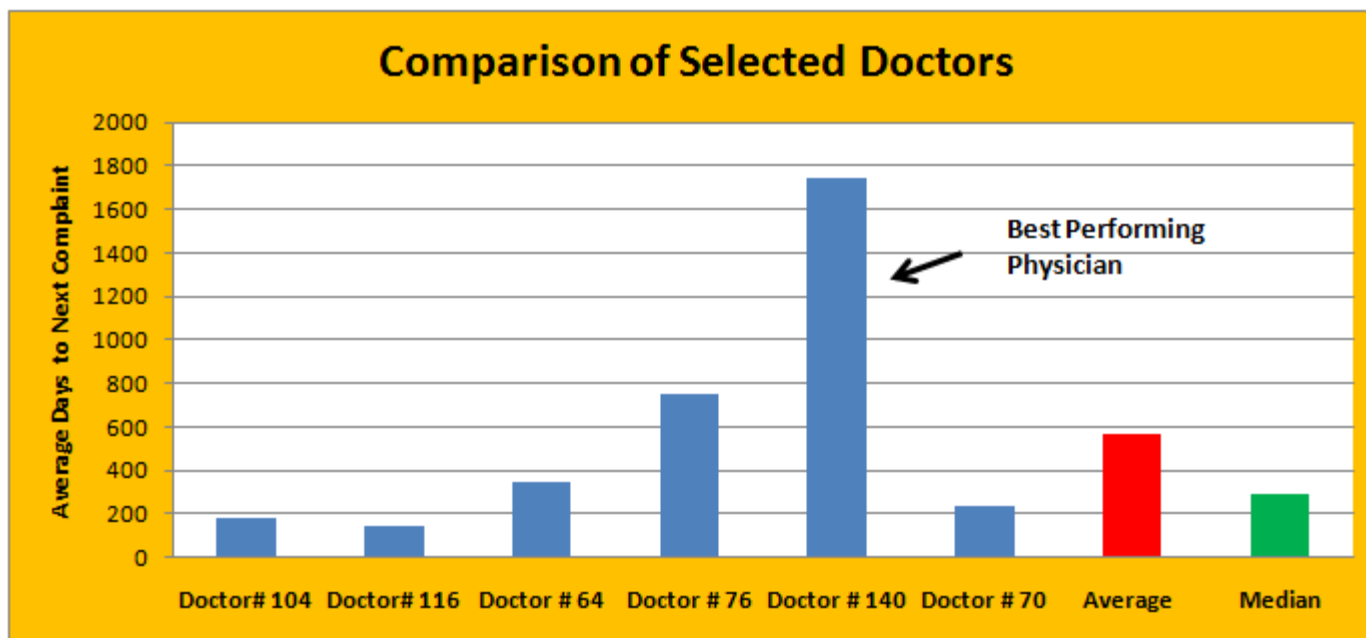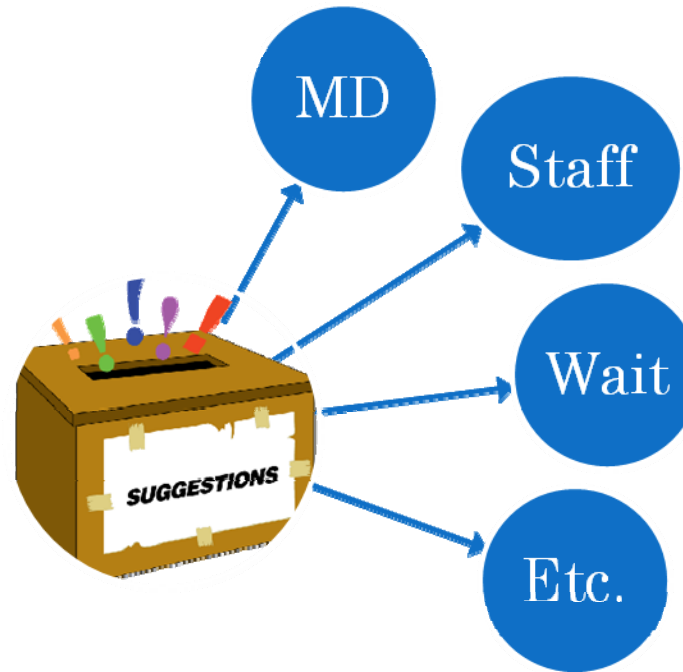
SENTIMENT ANALYSIS CAN ALSO CLASSIFY REASONS FOR COMPLAINTS

MD time

Staff related

Wait time

Etc.

SUGGESTIONS
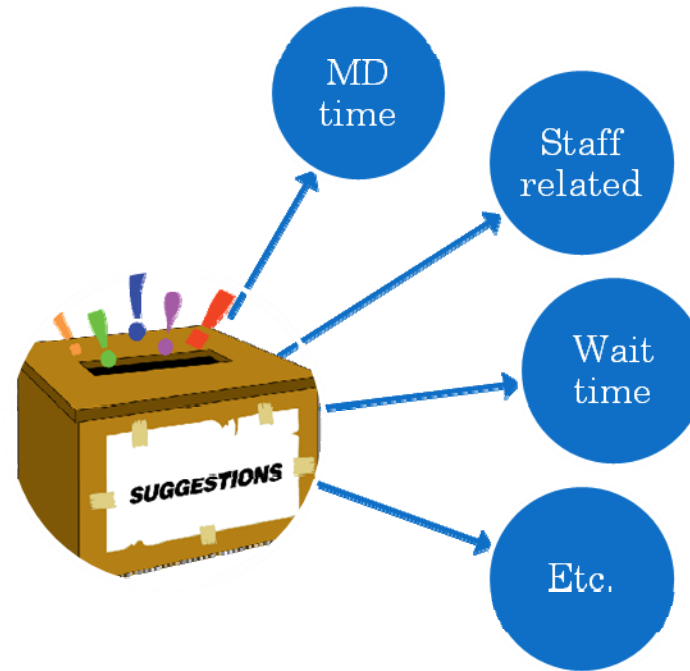
EXAMPLE:

His **staff** is horrific.

TOP TEN ONE, TWO, OR THREE-WORD CLASSIFIERS

Dr. gives good advice & treatment	1	knowledgeable (.16), knowledgable (.035), my (.021), very (.018), and (.018), delivered (.017), extremely (.0.17), rude (.017), excellent (.016), best (.015)
	2	knowledgeable_and (.062), very_knowledgeble (.052), and_knowledgeable (.039), knowledgeable_i (.020), knowledgable_and (.018), extremely_knowledgeable (.016), knowledge_and (.015), very_knowledgable (.014), saved_my (.012), he_is (.012)
	3	very_knowledgeable_and (.022), is_very_knowledgeable (.017), is_a_very (.013)
Dr. takes enough time	1	time (.176), takes (.078), questions (.049), answer (.030), spends (.027), rushed (.024), took (.023), you (.020), your (.019), all (.019)
	2	time_to (.128), the_time (.080), time_with (.068), takes_time (.045), takes_the (.032), took_the (.0.30), questions_and (.029), to_answer (.025), feel_rushed (.020), and_takes (.020)
	3	the_time_to (.080), time_to_answer (.043), took_the_time (.032), time_with_you (.030), time_to_talk (.025), time_to_listen (.020), she_took_the (.017), to_answer_all (.015), does_not_rush (.015), of_time_with (.015)
Dr. explains well	1	questions (.211), answer (.078), answered (.068), time (.046), explains (.028), answers (.028), takes (.024), answering (.022), all (.020), explained (.017)
	2	my_questions (.084), to_answer (.063), questions_and (.060), time_to (.045), answered_all (.037), your_questions (.024), any_questions (.021), questions_i (.021), the_time (.019), to_explain (.019)
	3	time_to_answer (.031), my_questions_and (.026), the_time_to (.025), answered_all_of (.023), of_my_questions (.022), all_my_questions (.021), to_answer_any (.016), to_answer_all (.016), willing_to_answer (.016), questions_i_had (.016)

TOP TEN ONE, TWO, OR THREE-WORD CLASSIFIERS

Dr. gives good advice & treatment	1	knowledgeable (.16), knowledgable (.035), my (.021), very (.018), and (.018), delivered (.017), extremely (.0.17), rude (.017), excellent (.016), best (.015)
	2	knowledgeable_and (.062), very_knowledgeble (.052), and_knowledgeable (.039), knowledgeable_i (.020), knowledg_and, extremely_knowledgeable (.016), knowledge_and (.015), very_knowle..._my (.012), he_is (.012)
	3	very_knowledgeable_a... (.013)
Dr. takes enough time	1	time (.176), takes (.07...), rushed (.024), took (.023), you (...
	2	time_to (.128), (.045), takes_the (.032), took_the (.0.30), rushed (.020), and_takes (.020)
	3	the_time... time_with_you (.030), time_to_talk ...the..., to_answer_all (.015), does_not_rush (...
Dr. explains well	1	questions (...068), time (.046), explains (.028), answers (.028), takes (.024), ...all (...), explained (.017)
	2	my_questions (.084), ...answer (...3), questions_and (.060), time_to (.045), answered_all (.037), your_questions (.024), any_questions (.021), questions_i (.021), the_time (.019), to_explain (.019)
	3	time_to_answer (.031), my_questions_and (.026), the_time_to (.025), answered_all_of (.023), of_my_questions (.022), all_my_questions (.021), to_answer_any (.016), to_answer_all (.016), willing_to_answer (.016), questions_i_had (.016)

A list of complaints can duplicate content of long satisfaction surveys

SAME INFORMATION AVAILABLE IN REAL TIME

Satisfaction surveys

Sentiment Analysis

Too delayed to be useful

Real time check on progress

Provides only standard reasons

Provides all reasons

Expensive, low response

Low cost, high response

SUMMARY

- Widespread available comments
  - Multiple sources
- Progress in Methods
  - Sentiment Analysis
    - Identify complaints
    - Classify causes
  - Benchmark with Time-to-next complaint
- Aggregators emerging
  - Google patent
  - Bing: search that evaluates options
  - Others

MORE INFORMATION   fa@georgetown.edu

1. Alemi F, Hurd P. Rethinking satisfaction surveys: time to next complaint. Jt Comm J Qual Patient Saf. 2009 Mar;35(3):156-61.

2. Alemi. F.A., Badr, N., Kulesz, S., Walsh, C., & Neuhauser, D. (2008). Rethinking Satisfaction Surveys: Minute Survey. *Quality Management in Health* Care 17(4): 280-191, pp. 281-282.

3. Pang, B., & Lee, L. (2008). Opinion Mining and Sentiment analysis. *Foundations and Trends in Information Retrieval* 2(1-2): 1-135, pp. 1-10.

4. Prabowo, R., & Thelwall, M. (2009). Sentiment Analysis: A Combined Approach. *Journal of Informetrics* 3(2): 143-157, pp. 143-145

5. Sacopulos, M., & Segal, J. (2009). Limiting Exposure to Medical Malpractice Claims and Defamatory Cyber Postings via Patient Contracts. *Clinical Orthopaedics and Related Research* 467: 427-433, pp. 427-428. DOI 10.1007/s11999-008-0619-3.

6. Turney, P. (2002). Thumbs Up or Thumbs Down? Semantic Orientation Applied to Unsupervised Classification of Reviews. In *The Proceedings of the 40th Annual Meeting of the Association for Computational Linguistics*: 417-424, pp. 417-421.