
UNNECESSARY IMAGING

Up to \$12 Billion Wasted Each Year

research and report provided by ReactionData

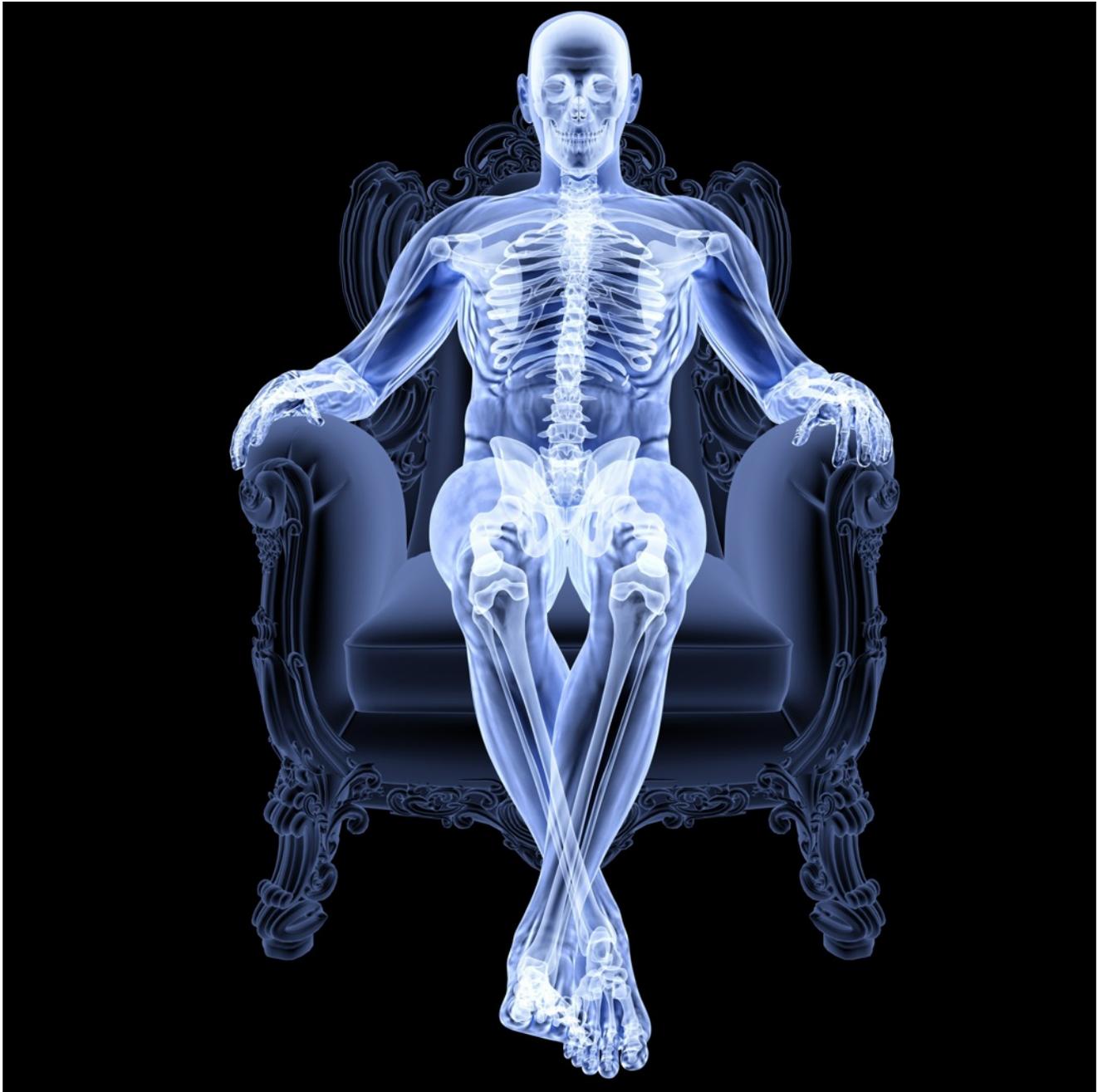


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Introduction

The world of healthcare is rapidly changing. New legislation, the rise of ACO's, an increasing need for patient feedback and countless other advances have disrupted the industry greatly, and we're still figuring out all the implications of these disruptions. Healthcare, historically speaking, has always been miles behind the curve when it comes to technological advances but that is no longer the case. There is probably no other industry that is going through as much technical innovation as is healthcare.

I know because I ran research for the most prominent healthcare tech market research firm in the world. I saw that business was speeding up and getting more competitive. This pointed to a rapidly evolving need for much better data, data in much larger quantities while also being very current. So ReactionData was created to do just that. My team built a proprietary ecosystem that gets a remarkable amount of targeted data very quickly (we call lots of specific data that was collected very rapidly Smart Data). Lightning fast data with no researcher overhead is our mantra.

The data in this report, like all other data we collect, is as relevant and fresh as it can be. We don't believe in taking months to mine data and then charging a premium to deliver stale information to our clients. Through this report we prove that it is absolutely possible to get all the data you need in just a matter of days and to illuminate areas of healthcare where timely data could prove useful to vendors and provider organizations alike.

You Can Use it Too!

Our system isn't a secret. Many global healthcare companies already use our ecosystem to get the data they need – customer satisfaction, conjoint analysis, win/loss, prospect research, event/trade show feedback and demo scheduling, advertising/message testing, etc.

If you'd like to learn how you can get better, faster data to run your business, shoot me an email or give me a call. I'll show you how to get Smart Data in a matter of minutes.

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Executive Summary

If we're being honest, “news” releases on the exorbitant costs of national healthcare spending and its projected growth no longer really count as “news.” We've seen enough headlines and read enough information already to be at least somewhat concerned over the spending trend in our country. If this sounds foreign to you, or if it sounds like we're being overly dramatic, let's introduce a number to this conversation: \$2.8 trillion (we left off the zero's to avoid redundancy). That's how much money the United States (individuals and the government combined) ¹spent on healthcare in 2012. That's 17.2% of the entire United States' GDP and it is projected to grow every year.

Of this \$2.8 trillion, there have been many claims about how much is wasted. On the high end, PricewaterhouseCoopers' Health Research Institute ²argued that \$1.2 trillion of it is wasted. A quick smell test tells us that this \$1.2 trillion figure is probably high, but either way healthcare is incredibly expensive and waste certainly contributes to its cost. That's led politicians, journalists, civic leaders, and healthcare professionals to rush to define the problem and provide their own preferred solutions.

This report centers on one lever of this cost, unnecessary imaging.

“We spend in the ballpark of \$100 billion a year on medical imaging,” ³said Dr. Rebecca Smith-Bindman, professor at the University of California, San Francisco. “And we need to invest some research dollars to figure out how best to spend these dollars and when to image more and when to image less.”

With so much being spent on medical imaging, we here at ReactionData decided to get to the bottom of this by using our proprietary smart data platform to get feedback from hospital physician leadership.

We collected data from 196 hospital leaders and came to the following conclusions:

- Reducing unnecessary imaging is a top strategic priority for a majority of providers.
- The cost of unnecessary imaging in the United States is at least \$7.47 billion each year and may be as high as \$11.95 billion annually, and even that metric may understate the problem.
- Defensive medicine is the most widespread cause of unnecessary imaging. Over 90% of hospital physician leadership said it was a prime contributing factor in unnecessary imaging.

1 www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/NHE-Fact-Sheet.html

2 <http://www.pwc.com/us/en/healthcare/publications/the-price-of-excess.jhtml>

3 health.usnews.com/health-news/news/articles/2012/06/12/huge-rise-in-ct-mri-ultrasound-scan-use-study

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- Patient demand also contributes significantly to unnecessary imaging according to 65% of physician leadership.
 - A majority of surveyed physician leadership (60%) also indicated physicians being unfamiliar with appropriate diagnostic tests has significantly contributed to this unnecessary imaging.
 - Very few providers feel they have developed a homegrown system to correct this problem.
 - By and large, the solution to unnecessary imaging at hospitals has been through internal processes, rather than using an outside vendor.
 - There is a huge opportunity for a vendor who can create a solution that will address unnecessary imaging, as almost all providers have expressed a need for it.

Unnecessary Imaging is a Serious Problem

We certainly sympathize with those who believe that Chief Medical Officers, Chief Medical Informatics Officers and other hospital leadership can be some of the hardest people on earth to reach. Still, it was easy for us to set those sympathies aside and use our platform to gather critical information from 196 of them in just two weeks.

First, we had to gain bearing of where these organizations stood in regards to reducing unnecessary imaging. In other words, we wanted to know how much of a priority reducing these wasted costs is for their facility specifically. So, we asked them. (see Figure 1)

Is Reducing Unnecessary Medical Imaging a Priority?

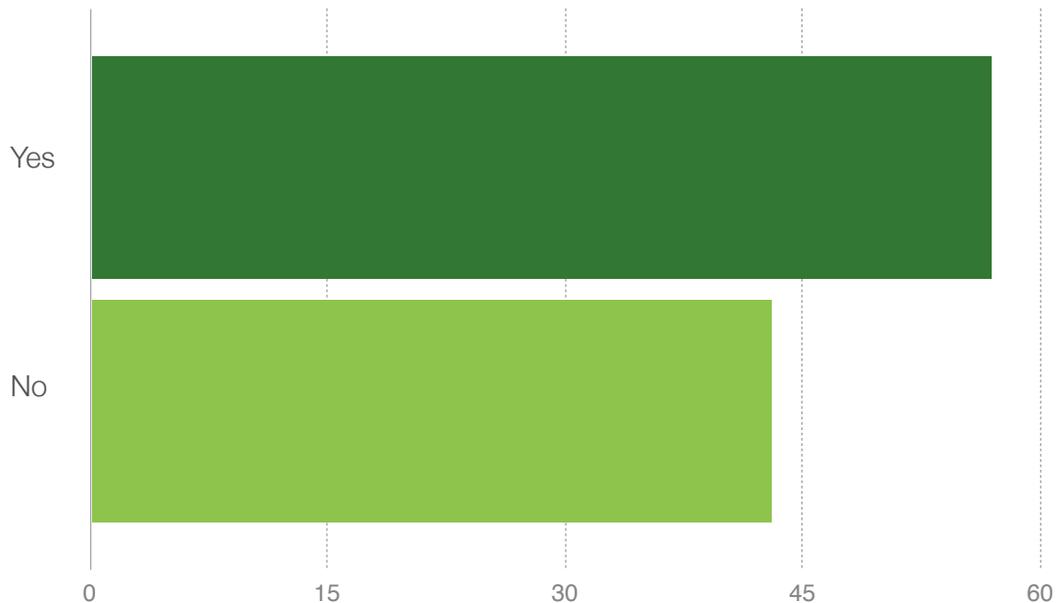


FIGURE 1: Responses to question "Is reducing unnecessary imaging a top strategic priority in your organization?"

Most acknowledged unnecessary imaging is a top priority, but for every respondent who answered no, we then asked why it isn't. (see Figure 2). We discovered that it in fact was a priority but that it took the back seat to current, more pressing issues in their facility.

Why Not a Top Priority?

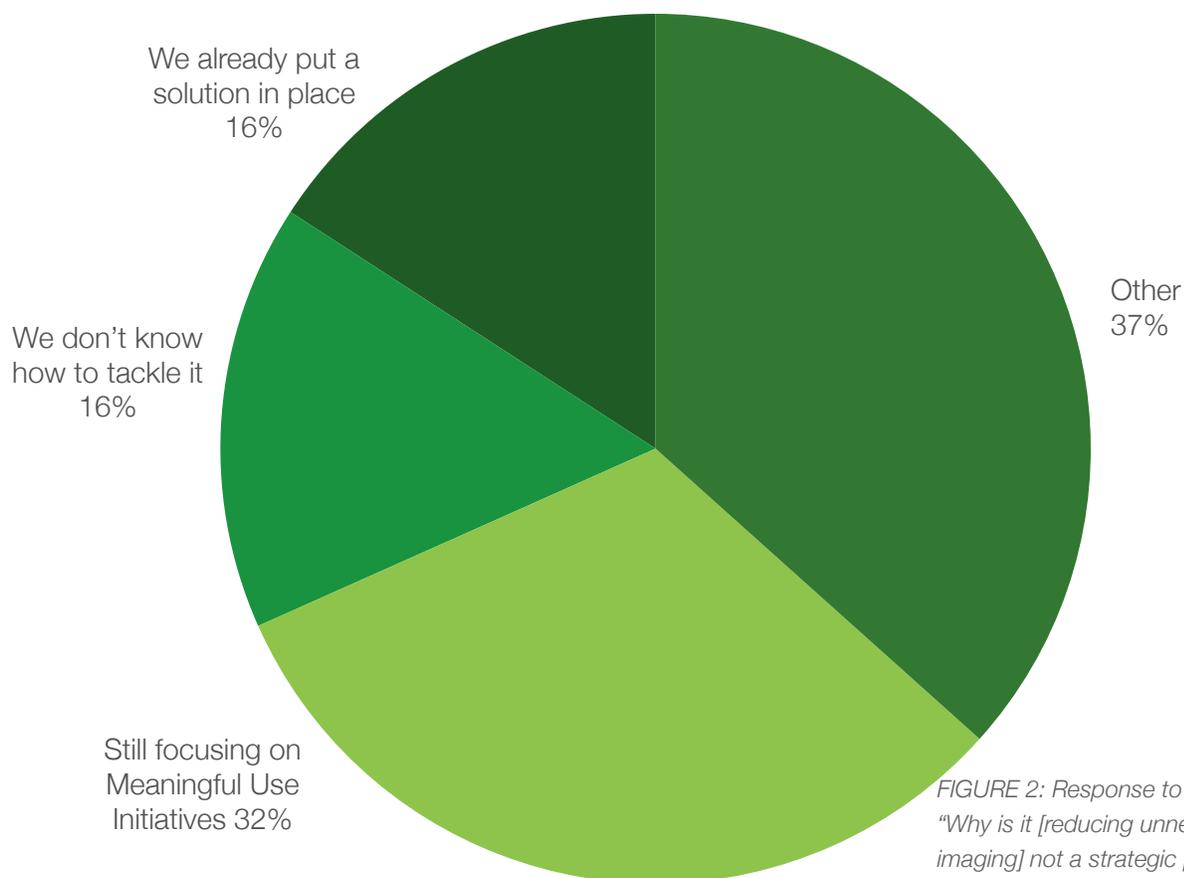


FIGURE 2: Response to question "Why is it [reducing unnecessary imaging] not a strategic priority?"

Only four hospitals suggested that there were "no indicators that unnecessary imaging is a significant issue here" or that it "has not been a major issue." Being that only 2% of hospitals felt this way, we wanted to find out if there was some underlying commonality that linked these four together.

We found that the four respondents who said it isn't an issue represented significantly smaller providers and resided in very small towns. The average number of beds of all 196 providers in the sample was 4811. Understanding that the number of beds in any given facility can vary greatly, we thought it appropriate to share that the median was 492. Continuing, we compared this to the mean and median of the four rebels who stood off from the majority.

These four facilities had an average of 353 beds with a median of 372. (see Figure 3) These four facilities are operating on a much, much smaller scale than the majority of facilities in our sample, as well as our nation. Rest assured that there is medical imaging waste at these locations, and significant amounts no doubt, but it's merely gone unnoticed due to the overall smaller amount of services rendered.

4 Bed counts were collected from the 2013 AHA Guide

How Size Affects Prioritization of Reducing Unnecessary Imaging

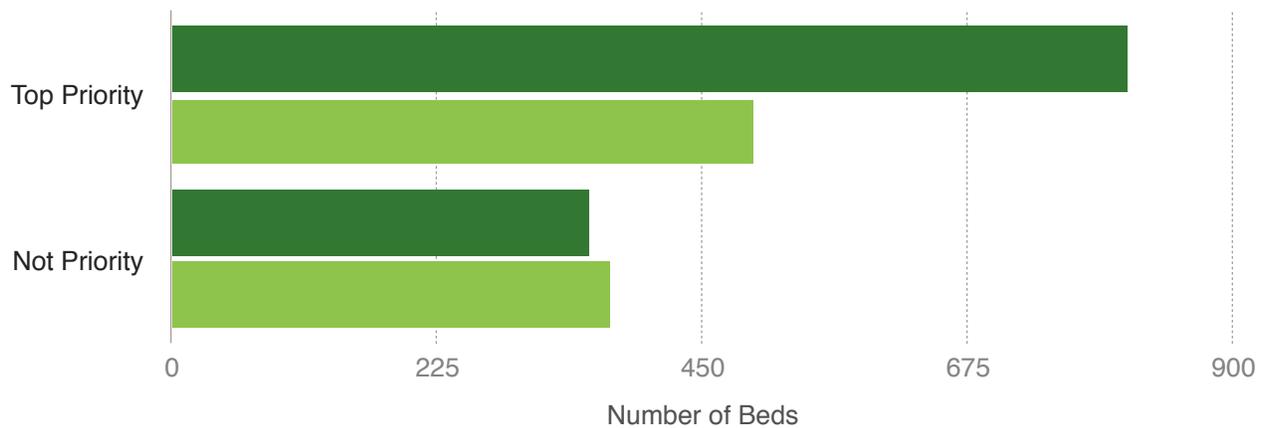


FIGURE 3: A comparison of the 'mean' and 'median' number of beds from our entire sample vs. the 4 organizations who said it was not an issue

One medical director concluded that wasted money on unnecessary medical imaging had “not been a major issue here”. Fair enough. Looking deeper, that hospital was located in a very small town (less than 10,000 people) and was isolated from any neighboring cities (they did have a Walmart, though). Another director shared that there were “no indicators” that money was being wasted on medical imaging. The fact that this hospital was located in a city with a population of ~70,000 did give it more credibility when compared to our prior example, but when compared to another hospital in a city of 600,000 people, with a Chief of Staff trying to make “radical reduction” of “needless imaging”, it highlights how the issue could potentially go unnoticed in smaller facilities. Changes in the way providers are compensated, along with a desire to practice better medicine, have made reducing unnecessary imaging a concern for almost all physician leadership and a top strategic priority for a majority of institutions.

The Questions

With the knowledge that a majority of providers view reducing unnecessary imaging as a top strategic priority and less than 3% of providers suggested it isn't a problem, two questions are easily posed:

First, how big of a problem is it? Specifically, how much money does it cost the United States (government and people) every year?

Second, what is the cause of this unnecessary imaging? This will give a road map toward correcting the problem.

How Big is the Problem?

To determine how big the problem is, we combined information from several sources. First, we found multiple sources that suggested the total cost of imaging is approximately ⁵\$100 Billion per year.

Once we had this information, we were able to combine the results of our survey to estimate the amount of waste in our system.

Our mobile platform asked every person for whom reducing unnecessary imaging was a top strategic priority approximately what percentage of their imaging is unnecessary (see Figure 4). We then used this information to create a low-end estimate and a high-end estimate based upon the ⁶categories selected.

Low End

On the low end, we assumed the lowest possible figure for each segment (5% for the 5-10% and so on) and calculated an overall percentage based upon the size of the ⁷groups.

This combined for a total of 7.47% of all imaging. Applying that across the spending, we find that the low-end estimate for cost of unnecessary imaging is \$7.47 billion each year.

High End

With the high-end estimate, we chose the largest number in each segment. For the over 10% group, we chose 15% as the high mark.

After combining these totals, we came up with a total of 11.95% of imaging. This means that our cost estimate for the high end is \$11.95 billion.

5 The most prominent source displaying this number is <http://health.usnews.com/health-news/news/articles/2012/06/12/huge-rise-in-ct-mri-ultrasound-scan-use-study>

6 Given that those who said it wasn't a top priority suggested it was still a problem in line with the results here, we felt comfortable projecting this segment's results onto the entire sample.

7 These numbers seem extremely low and unlikely, but the goal of this estimate was to provide the lowest possible number our data would suggest

Percentage of Imaging Volume Considered Unnecessary

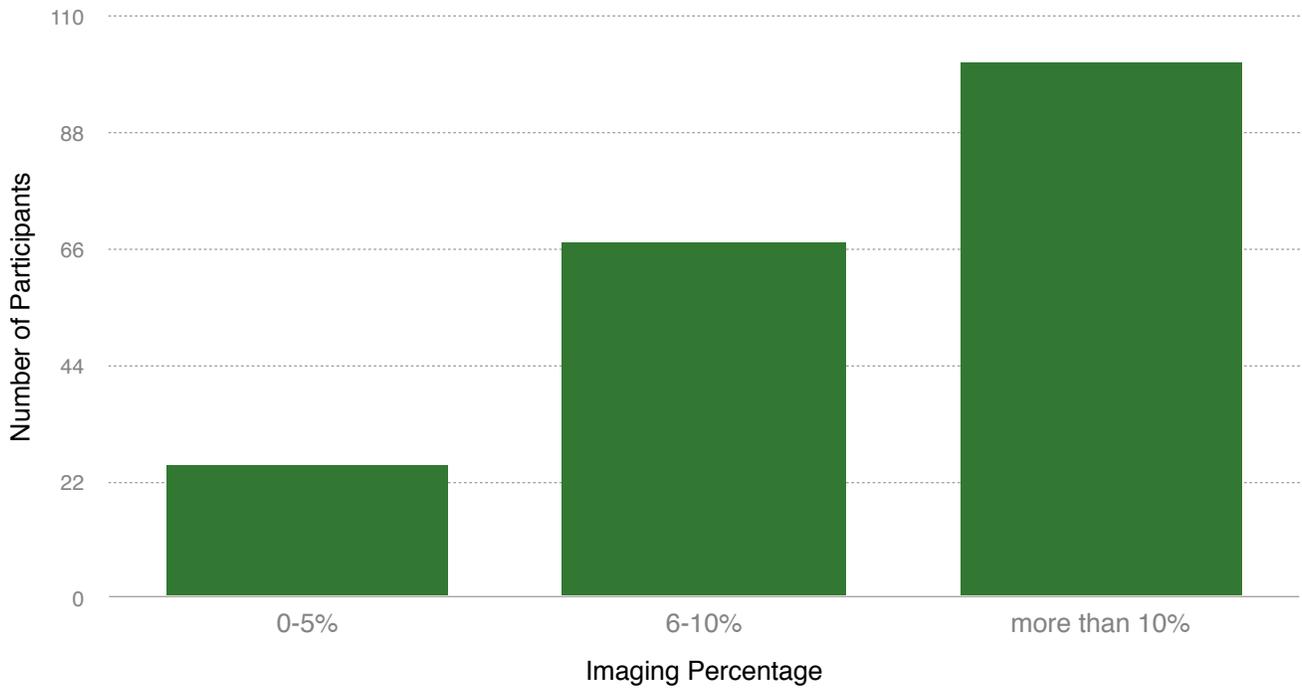


FIGURE 4: How much of your total imaging volume do you think represents unnecessary imaging?

The Range

This means the annual waste in American healthcare on unnecessary imaging costs society between **\$7,470,000,000 – \$11,950,000,000.**

What Causes This Problem?

Identifying a problem is just the first step. Understanding the cause of the problem is critical to building a program to eventually eliminate (or at least greatly reduce) the problem. Physician leadership and other providers overwhelmingly highlighted just three prominent culprits of inappropriate imaging: (see Figure 5).

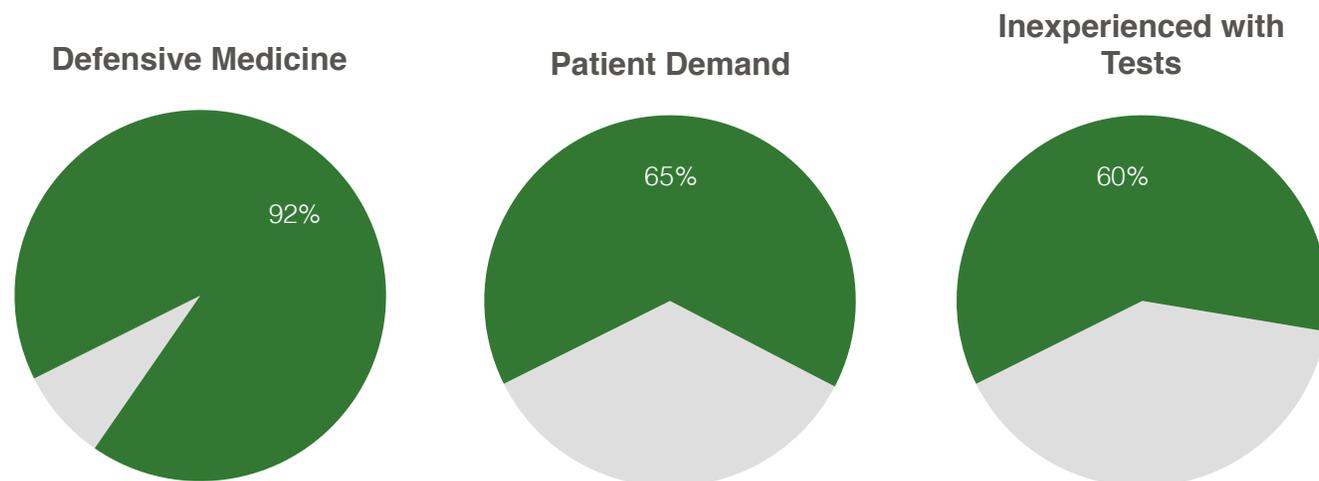


FIGURE 5: Participant responses when asked “What is the source of unnecessary imaging?”

1. Defensive Medicine - Doctors are, with good reason, nervous about making mistakes with patient care so they err on the side of caution (ordering more scans than are necessary). Getting called into a review board or being named in a lawsuit tends to make one cautious.
2. Patient Demand – With resources now available on the internet for patients to research medical issues, many figure out the scans they want and demand their physicians order them. Remember the explosion of 64-slice cardiac CT requests by patients after watching that Oprah special?
3. Imperfect Information – It’s becoming nearly impossible for clinicians— particularly primary care physicians, internists, and the like— to stay abreast of all the advances in imaging. This isn’t because they’re incompetent, it’s because these physicians are overworked and see countless different kinds of cases every day. Plus, almost none of them have the requisite clinical decision support tools installed in their EHRs to assist in ordering the right scan type.

The above reasons are exacerbated by a payment model that encourages volume over quality. The current, and extremely painful, trend towards quality-based reimbursement models should hopefully assist in alleviating inappropriate imaging.

None of the other suggestions coalesced around consistent issues. Rather, most of the comments actually directly related to the three groups detailed above.

The key takeaway from this is that defensive medicine is the biggest cause of this unnecessary imaging. However, patient demand and lack of understanding on the part of physicians are also key factors.

Who has Solved It?

Figure 2 mentioned that 16% of those who said reducing unnecessary imaging isn't a top strategic priority suggested their organization had already put a solution in place to correct the problem.

These 16% (12 people total) were then prompted to state which vendor they had used. Six respondents answered (1 CIO and 5 Chief Medical Officers). All suggested they did so on their own with a mix of homegrown technology and process improvements without the assistance of an outside vendor.

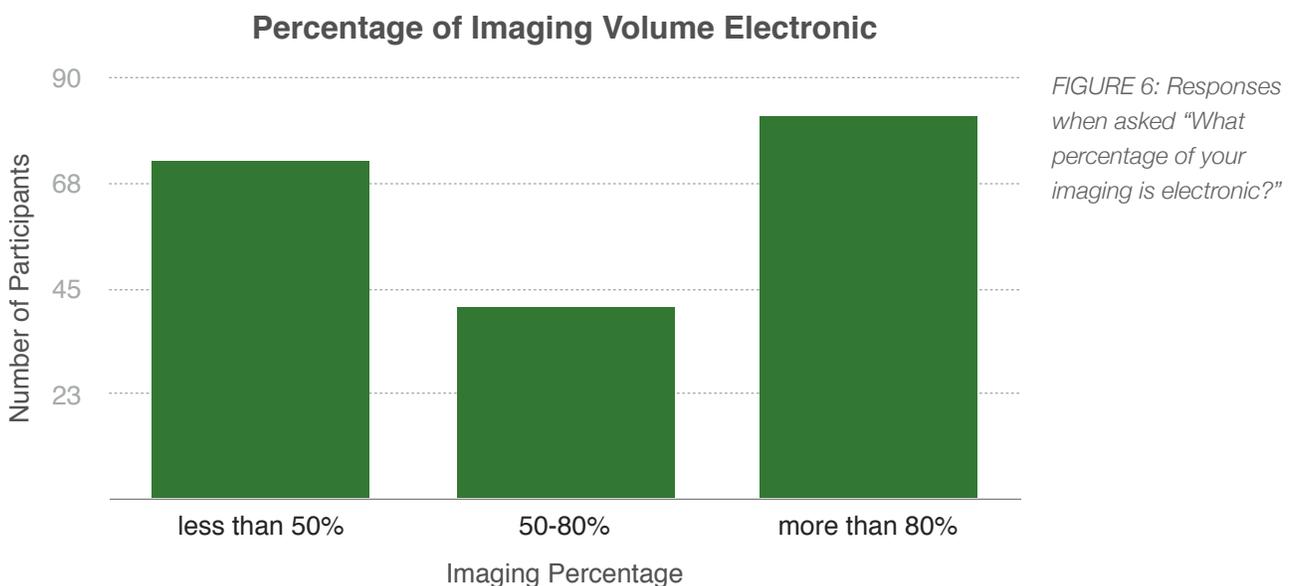
That no vendor was mentioned shows how truly greenfield this area is. It presents an incredible opportunity for innovative healthcare vendors to jump in and assist in providing a solution that will have a tremendous ROI.

Managing Radiology and Imaging

In asking about imaging, it seemed proper to assess how providers are managing radiology. Therefore, this study asked every participant about two different aspects of radiology ordering and service-line management.

Electronic Ordering Totals

Unsurprisingly, most feel electronic exam ordering is an important tool in eliminating unnecessary imaging. For that reason, we asked respondents how much electronic ordering they do for outpatient imaging. (see Figure 6)



RBM, ACO, or Other

We also sought to determine how radiology imaging services are managed within an organization. We found that a third have moved these services under an accountable care organization (ACO) model with nearly the same number stating that they manage their imaging services in a more traditional way using a Radiology Benefits Manager (RBM). Most listed other ways of managing imaging services such as contracting with an outside radiology group, while many others stated that they are in process of moving towards an accountable care model. (see Figure 7)

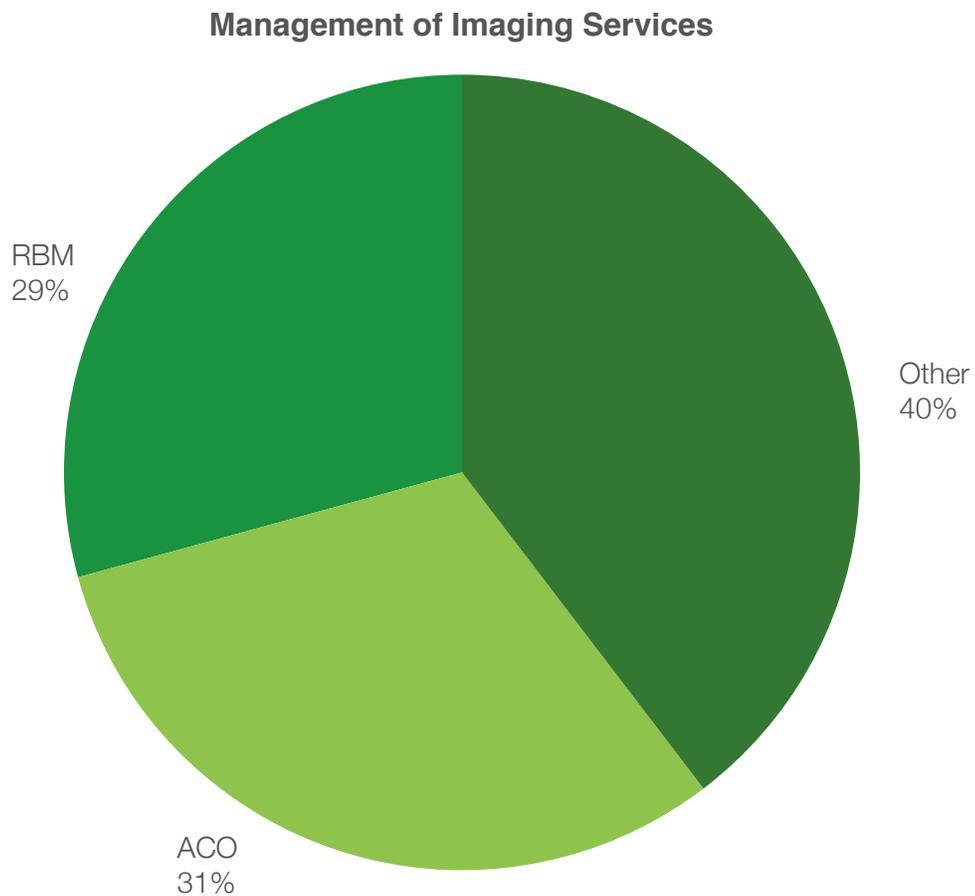


FIGURE 7: Responses when asked "Are your imaging services managed by a Radiology Benefits Manager (RBM) or are you part of an ACO?"

Conclusion

From this data, it is clear that unnecessary imaging is a big problem. It costs the United States government and people somewhere between \$7.47 billion and \$11.95 billion dollars each year. These are big numbers and that in and of itself can be rather daunting. However, the silver lining in the data point to some very specific solutions that can help to eliminate this waste, namely aligning reimbursements with results, and perhaps most importantly providing doctors with easy-to-use technology that will enable them to order the right exams at the point of care. Simply put, physicians want to do right by their patients but most of them don't have tools that help them do this.

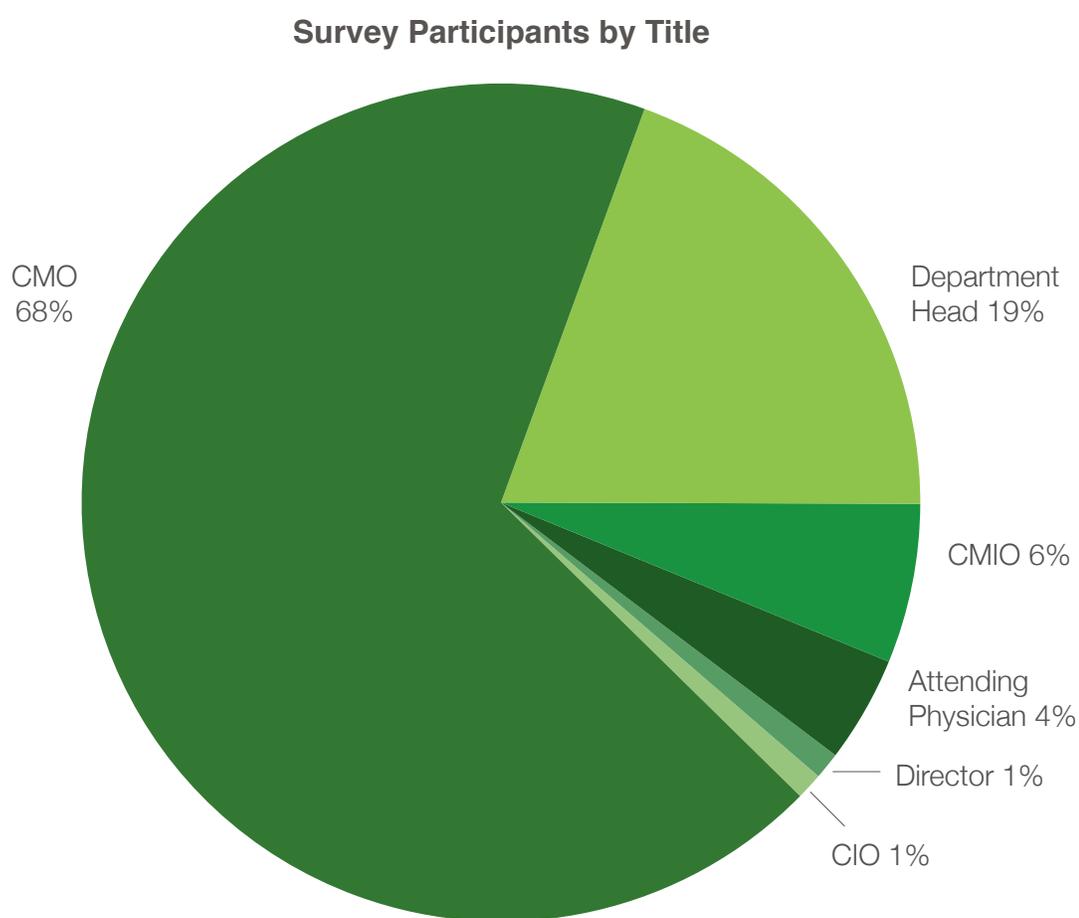
We'd be remiss if we didn't bring up how tort reform could assist in reducing healthcare costs as well but that's another report for another time...

Appendix A

Survey Participants by Title

Unfortunately, many research firms spend their time getting input from people who can't make decisions. That's not the ReactionData model. Rather, we try to get feedback from decision makers and key leaders whose opinion can actually have an impact. For that reason, and in an effort to be transparent, this is a breakdown of the participants in our survey by job role. There were 196 unique participants.

Rest assured, the data that we collected is valuable and accurately reflects the opinions of key decision makers in healthcare.



Appendix B

Hospitals That Participated

The information provided by individual providers is anonymous and will not be shared. In addition, we want to maintain the privacy of those who individually chose to respond. That said, we felt it appropriate to list the institutions represented in this study. Thank you to the representatives of the following institutions who participated in this report:

St. Bernardine Medical Center	Margaret Mary Community Hospital
Texas Health Presbyterian Hospital Plano	Cary Medical Center
St. Peter's University Health System	Mercy Medical Center Merced Community
Jackson Health System	SSM St. Clare Health Center - Fenton
Wyoming Medical Center	Rockdale Medical Center
St. Elizabeth Medical Center	Providence Hospital & Medical Center
Excela Health	Yuma Regional Medical Center
University of Maryland Medical Center	Canonsburg General Hospital
DeKalb Health	Holy Spirit Health System
Children's Hospital	EASTAR Health System
St. Luke's Hospital	Warren General Hospital
Children's Hospital Colorado	Peninsula Regional Medical Center
North Country Medical Center	Memorial Health System
Humboldt General Hospital	Baystate Health
Samaritan Hospital	Homestead Hospital
Children's Hospital - Minneapolis	Essex Valley Healthcare
Trinity Medical Center West	Marion General Hospital
Orange Regional Medical Center	TJUH, Methodist Hospital
Children's Urgent Care	Intermountain Healthcare
St. Elizabeth's Hospital	Hartford Health Care Corporation
Mercy Medical Center	St. John's Riverside Hospital - Andrus Pavilion
NorthBay Medical Center	Yuma Regional Medical Center
Suburban Hospital	Medical Center of Central Georgia
Good Samaritan Hospital	Yavapai Regional Medical Center
Scripps Green Hospital	St. Joseph Medical Center
Jersey City Medical Center	Mary Washington Hospital
Northern Inyo Hospital	Community Hospital of the Monterey Peninsula
Memorial Regional Hospital	St. John Hospital & Medical Center
Thomas Hospital	Knox Community Hospital
Highland Community Hospital	Munson Healthcare
The Western Pennsylvania Hospital	St. Francis - Downtown
Mercy Medical Center - Clinton	Alameda Health System
Tacoma General Hospital	Flagler Hospital St. Augustine
St. Joseph's Hospital - Breese	Sacred Heart Hospital

Banner Baywood Medical Center
Ed Fraser Memorial Hospital
Primary Children's Medical Center
Alice Peck Day Memorial Hospital
Barton Memorial Hospital
Jersey Shore University Medical Center
Lowell General Hospital
Baystate Medical Center
Tahoe Forest Hospital District
Bayhealth
Mariners Hospital
Share Medical Center
Lake Charles Memorial Hospital
Ruby Valley Hospital
Atlantic Health System
Lindsay Municipal Hospital
Sutter Auburn Faith Hospital
Beaumont Hospital - Troy
Perry Memorial Hospital
St. Luke's Cornwall Hospital - Cornwall Campus
Klickitat Valley Hospital
Sheridan Memorial Hospital
Advocate Sherman Hospital
Sharon Hospital
BayCare HEALTH SYSTEM
Osceola Community Hospital
Cheshire Medical Center/Dartmouth - Hitchcock Keene
I-70 Community Hospital
Hancock Medical Center
Vanguard West Suburban Medical Center
Cuyuna Regional Medical Center
Otis Health Care Center
MUSC Medical Center
Fremont Area Medical Center
Good Samaritan Hospital
Sierra Vista Regional Medical Center
Kings County Hospital Center
UnityPoint Health
Reading Health QuickCare - Berkshire Heights
UT Health Northeast
Northeast Georgia Medical Center
Richmond University Medical Center
Wellmont Health System
Commonwealth of Massachusetts, Department of Public Health
Regional Health

Swedish Medical Center
Golden Valley Memorial Hospital
University Hospital of Brooklyn SUNY Center
UPMC - Horizon
UHS Chenango Memorial Hospital
PeaceHealth St. John Medical Center
Martin Health Systems
Children's Mercy Hospitals & Clinics
Rice Memorial Hospital
Erie County Medical Center
UC Davis Medical Center
Broadlawns Medical Center
CarePoint Health
Texas Health Presbyterian Hospital Dallas
UNM Hospitals
Phelps County Regional Medical Center
Ochsner Health System
Elliot Hospital
Davis Health System
City Hospital
Shriners Hospital - Salt Lake City
City of Hope National Medical Center
Audubon County Memorial Hospital
Scotland Memorial Hospital
Phoenix Children's Hospital
Shands Jacksonville Medical Center
Genesis Medical Center - Illini Campus
Benson Hospital
North Caddo Medical Center
Redington-Fairview General Hospital
Children's Hospital of Wisconsin - Fox Valley
Community Hospital - East
Arnold Palmer Medical Center
Sanford Bismarck
DMC Rehabilitation Institute of Michigan
Madison Valley Hospital
Pocahontas Memorial Hospital
Memorial University Medical Center
Valley Regional Hospital
Avera Flandreau Hospital
Clarinda Regional Health Center
Choctaw General Hospital
Mercy Hospital Springfield
Fairview Lakes Medical Center
Swedish Medical Center - Ballard
Coliseum Northside Hospital

The Wisconsin Heart Hospital
Morehead Memorial Hospital
McKay-Dee Hospital Center
Lifespan
Lee Memorial Hospital
Weeks Medical Center
Hutchinson Community Hospital
Edwards County Hospital
University Hospital
Cape Cod Hospital
Adventist Health System
Rockville General Hospital
St. Francis Hospital
Surgery Center of Des Moines - East
OhioHealth O'Bleness Hospital
Washington Regional Medical Center
Murray-Calloway County Hospital
Sylvester Comprehensive Cancer Center

Firelands Regional Medical Center - Main Campus
Beauregard Memorial Hospital
Kewanee Hospital
Ellinwood District Hospital
Red Bud Regional Hospital
St. John's Hospital - Berryville
Mary Bridge Children's Hospital & Health Center
The Moncton Hospital
Molokai General Hospital
Grady Memorial Hospital
Clear Lake Regional Medical Center
Arkansas Surgical Hospital
Central Maine Medical Center
Nicholas H. Noyes Memorial Hospital
Platte Health Center - Avera
Marlboro Park Hospital
Exempla St. Joseph Hospital
St. Paul's Hospital