



How Amazon Plans To Use Its E-Commerce Dominance To Transform Healthcare

Amazon could use its expertise to disrupt everything from the pharmaceutical supply chain to Medicare management. We break down the healthcare areas best suited for an Amazon entrance.

Amazon is looking to dominate more than just online retail.

The e-commerce behemoth is serious about entering healthcare, bringing with it a non-traditional business model, infrastructure in logistics & computing, and customer love.

Many existing health giants are scrambling to compete, while others are looking for ways to Amazon-proof themselves.

But this isn't Amazon's first attempt at transforming the space.

Between 1999-2000, the company began investing money into Drugstore.com with plans to expand its e-commerce business into the pharmacy space. It eventually ran into the existing web of middlemen, regulators, and more, which brought its ambitions to a halt.

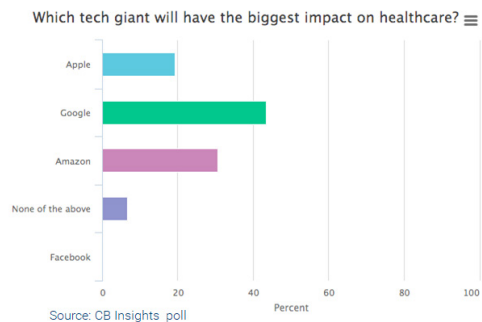
Now, Amazon is trying again. Earlier this year, it announced a joint healthcare venture with JPMorgan Chase and Berkshire Hathaway. Before the collaboration, the company acquired online pharmacy PillPack for nearly \$1B.

But it's not the only tech company expanding into healthcare.

Many are advancing in the space by playing to their strengths: Apple's patient-centric vision prioritizes consumers, while

Google continues to apply AI to everything from medical devices to lifestyle management solutions. Microsoft is building health data management on top of its cloud platform Azure. growth in Q2'18, jumping 12% YoY.

In our **Healthcare 2025 research briefing**, we asked which tech giant would have the biggest impact on healthcare. Even before announcing any concrete plans, Amazon came in second place – just behind Google.

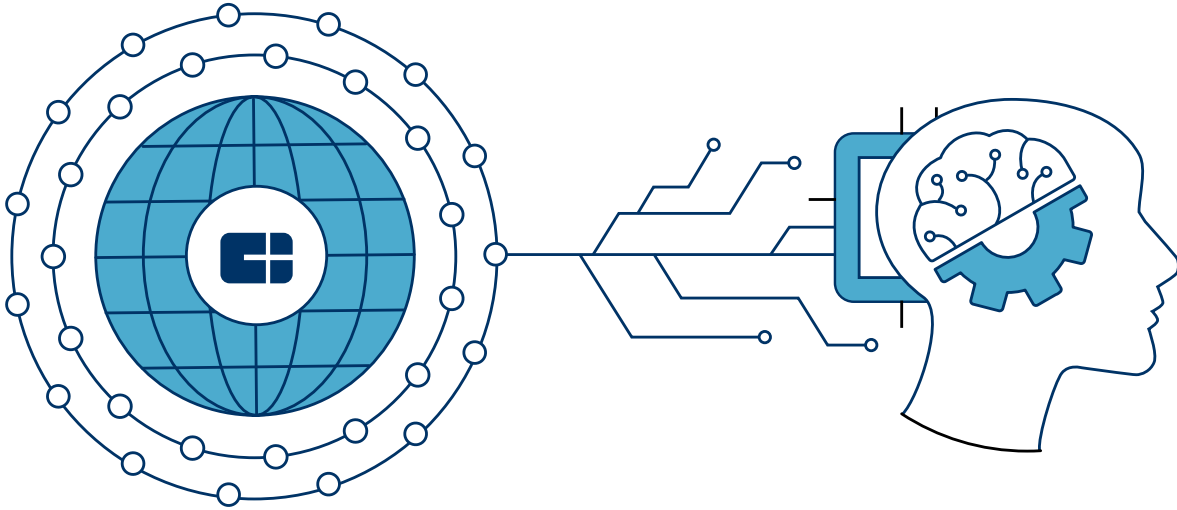


But as the e-commerce giant moves into the healthcare sector, many questions arise:

- What strategies does the company plan to use to enter new target verticals, especially those with established leaders in the space?
- Which companies are most at-risk for an Amazon entrance? What business models will become obsolete if Amazon chooses to enter the space?
- Will Amazon's advantages – which have worked well in areas such as retail – translate across healthcare, or is the company out of its element?
- Is the timing right? What factors today will enable Amazon to succeed in healthcare?
- Using CB Insights data, we dig into how Amazon is pushing into healthcare, focusing on how the company is leveraging its current strategy to move into different areas across the space.

Table of Contents

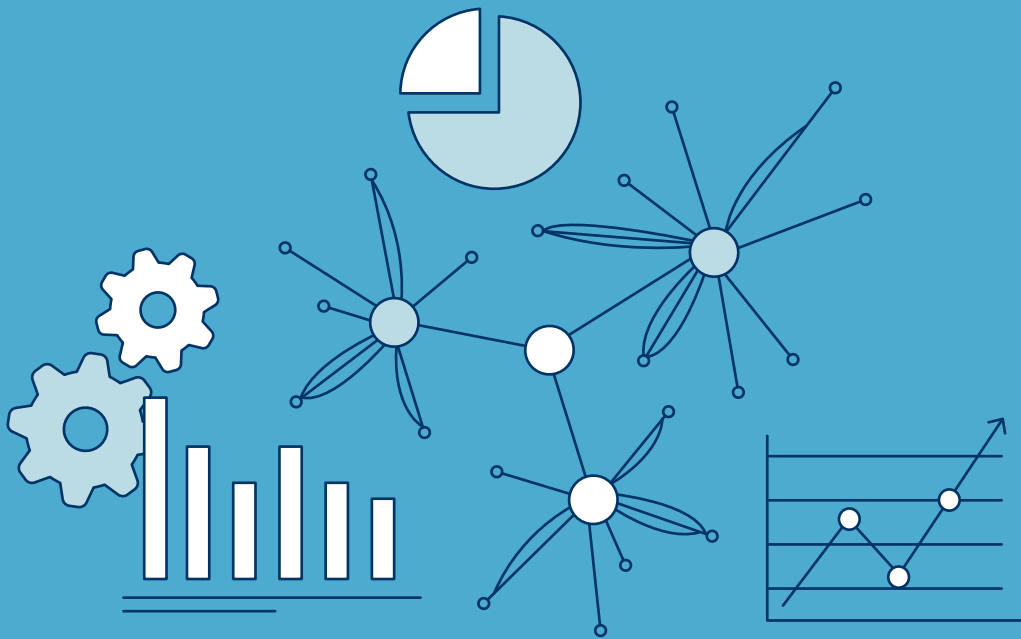
- 1 Amazon's advantage, philosophy, and strategy**
 - Amazon's healthcare edge
 - The Amazon approach
- 5 Amazon the pharmacy**
 - The pharmacy supply chain and PillPack
 - Post-PillPack: Cash pay patients, pharmacy benefits, and FBA for drug manufacturers?
- 10 Amazon, claims management, and health benefits**
 - Attacking claims management
 - From claims manager to benefits manager
- 13 Amazon Medicare/Medicare management**
 - Why Medicare/Medicaid?
 - Prime for groceries and home needs
 - Alexa can help with home care
 - Clinics coming soon?
- 21 Amazon and providers**
 - The backwards integration strategy
 - Alexa and the medical record
 - Amazon the B2B (and B2C) supplier
- 28 Amazon, the healthcare cloud, and the lab**
 - The healthcare cloud
 - AWS and the lab startup
- 33 Conclusion**



At CB Insights, we believe the most complex strategic business questions are best answered with facts.

We are a machine intelligence company that synthesizes, analyzes and visualizes millions of documents to give our clients fast, fact-based insights.

From Cisco to Citi to Castrol to IBM and hundreds of others, we give companies the power to make better decisions, take control of their own future, and capitalize on change.



WHERE IS ALL THIS DATA FROM?

The CB Insights platform
has the underlying data
included in this report

[CLICK HERE TO SIGN UP FOR FREE](#)



“We use CB Insights to find emerging trends and interesting companies that might signal a shift in technology or require us to reallocate resources.”

Beti Cung,
CORPORATE STRATEGY, MICROSOFT



TRUSTED BY THE WORLD'S LEADING COMPANIES





Amazon's advantage, philosophy, and strategy

AMAZON'S HEALTHCARE EDGE

As Amazon enters healthcare for the second time, it brings several new strengths to the table.

Its current scale and reach are larger than ever before. The company has a direct distribution advantage to over 300M active customers, 100M Prime Members, and approximately 5M sellers on the site, which could prove useful should it ever develop health solutions for small businesses.

By teaming up with JPMorgan and Berkshire Hathway, Amazon now has an additional pool of more than 1.2M employees – diverse in socioeconomic status, geography, and age, among other factors – to test its products on before releasing them to the public.

This could be helpful when searching for solutions that work for both specific use cases (e.g. chronic disease management) and population demands (e.g. pharmaceutical delivery).

Amazon has a large testing ground and aggregated consumer demand

1.2M employees between
Amazon-JPM-Berkshire

5M estimated
sellers on Amazon

310M
Active Customers
(100M Prime Members)

CBINSIGHTS TechQuint, Entrepreneur

Amazon's ecosystem has also given it more cash to deploy, which is why it can afford to pursue low-profit initiatives. As stated in the Amazon-JPM-Berkshire partnership announcement, the companies want to build an independent healthcare company "free from profit-making incentives and constraints."

This is doable for Amazon, which can make money by growing its core businesses like AWS and Prime, and enter into healthcare willing to eschew profit as its other businesses become more valuable.

Existing health giants will find it difficult to compete with a company whose strategy is not dependent on making a profit in healthcare.

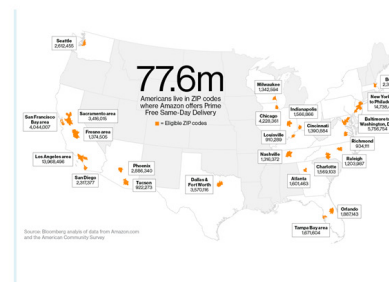
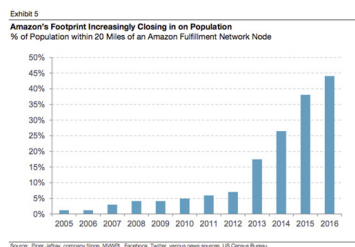
But Amazon has used this strategy for decades.

It has reinvested its revenue into massive infrastructure build-outs in the logistics and data center spaces, which will be a significant advantage as it enters healthcare.

Amazon Web Services (AWS), for example, can help handle the enormous data loads and analysis required in the healthcare space.

Amazon's fulfillment centers, supply chain, and acquisition of Whole Foods has put it within range to distribute healthcare goods and services quickly.

The logistics infrastructure – Amazon can get things to you quickly



CBINSIGHTS | Bloomberg Business Insider

The last critical advantage Amazon brings to the table is its brand.

Customer experience has been an afterthought in almost every part of healthcare, and is reflected in the poor NPS scores (related to customer satisfaction) across the board.

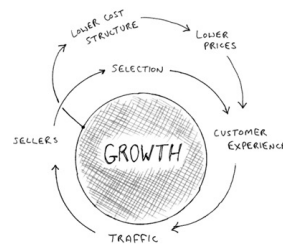
Amazon will likely leverage its obsessive focus on consumer experience to persuade customers to switch to its offerings. The question becomes whether Amazon can bring its consumer-first brand into healthcare faster than existing healthcare companies can improve.

THE AMAZON APPROACH

As Amazon enters new spaces, it follows a strategic playbook:

Amazon's playbook

Companies can focus on their core competencies and outsource the rest to Amazon



1. Attract + retain users to the platform with a better user experience and customer experience
2. Invest in large, upfront, fixed cost aspects of a business (e.g. warehouses, data centers)
3. Bring standardization to messy, unstructured, and fragmented back-office functions (e.g. logistics)
4. Add transparency and a platform for companies to distribute goods and services

CBINSIGHTS Jeff Bezos, illustrated by CB Insights

First, Amazon introduces a customer-friendly product with a user experience and customer experience superior to that of its competition. This allows the company to build economies of scale, network effects, and leverage for negotiating with other parties (e.g. suppliers).

Then, it invests in upfront fixed costs that allow it to function better and provide an outsourced version of services to its customers. We've seen this with Fulfilled By Amazon (FBA) and Amazon Web Services (AWS), which allow companies to use traditionally expensive services (warehouses, data centers, etc.) on a rent-to-own basis.

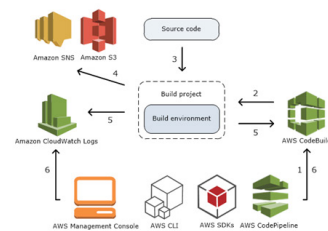
Amazon = platform + back end infrastructure for business

Fulfillment By Amazon handles delivery, inventory management, and customer returns



CBINSIGHTS Amazon, AWS

AWS handles datacenter management and associated cloud services



By attracting enough users to a platform and offering its own outsourced services, Amazon can then standardize suppliers' offerings on its platform. This allows it to create transparent and competitive markets for buyers and suppliers.

Hiring Atul Gawande to lead its joint healthcare venture with JPM and Berkshire suggests a continuation of this playbook.

Gawande is focused on using standardization as a means of scaling up healthcare, especially for relatively commoditized goods and services.

Lack of standardization and focus on consumer experience has resulted in an incredibly fragmented, opaque market in healthcare, which makes the following particularly vulnerable to Amazon's entrance:

- Middlemen that are value extractors and have large profit margins
- Companies that focus on formatting or coordinating information
- Areas where customer experience has been an afterthought
- Companies that have relied on opaque pricing as a business model

We'll dive into the healthcare areas that Amazon has the ability to transform using its strengths in the e-commerce space.

2

Amazon the pharmacy

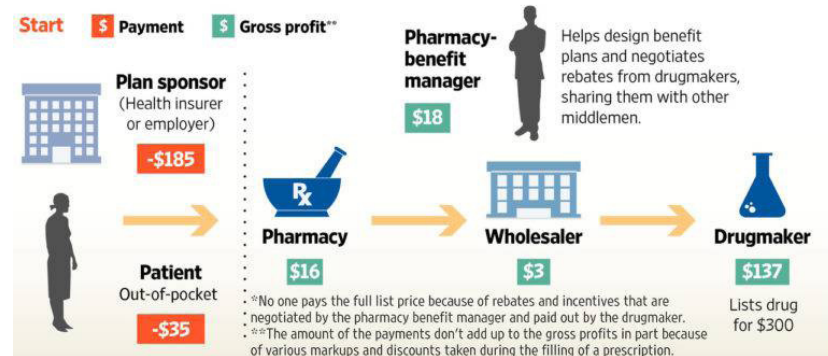
THE PHARMACY SUPPLY CHAIN AND PILLPACK

The pharmaceutical supply chain in the US is convoluted, filled with middlemen and confusing business models.

For example, more than three entities are involved in bringing a drug from manufacturer to patient, and each party takes a percentage of the profit along the way.

Sharing the Wealth

Here is how profits are shared from a brand-name drug with a list price of \$300*. Of the middlemen involved in the process, a pharmacy benefit manager gets the biggest gross profit of \$18.



Sources: Pembroke Consulting; WSJ staff reports

THE WALL STREET JOURNAL

Amazon has the opportunity to simplify the supply chain and improve the experience/cost matters for patients, payers, and manufacturers.

The company has made significant headway into the pharmaceutical distribution space with its ~\$1B acquisition of mail-order pharmacy PillPack. With this purchase, Amazon gained a \$100M revenue run-rate business, a built out pharmacy supply, and pharmacy licenses in all 50 states.

PillPack is a good fit for Amazon. The company is loved by its customers, claiming an NPS score of 80 compared to the pharmacy average of 26. Customer demand also helped the company reestablish its partnership with pharmacy benefits giant Express Scripts after a public falling out. In an email to its customers, PillPack stated:

“Late last week, PillPack and Express Scripts reached an agreement that will allow PillPack to continue to serve you as an Express Scripts’ customer. This means your service with PillPack will not be impacted – we are happy to remain your pharmacy. We absolutely could not have done this without you. Thank you for your stories, letters, and constant encouragement throughout this period. Your voice is an important reminder of why PillPack exists – we’re here to help you stay healthy.”

This focus on customer experience works well with Amazon's ethos.

Additionally, PillPack's platform for prescription management known as pharmacyOS shares similarities to Amazon's order management and fulfillment services Fulfillment by Amazon (FBA).

PillPack will handle medication dispensing, monitoring, and support via pharmacyOS. It also offers these services to payers, manufacturers, and new companies in the form of a pharmacy delivery API to plug into. This could integrate well with Amazon's existing distribution model.

POST-PILLPACK: CASH PAY PATIENTS, PHARMACY BENEFITS, AND FBA FOR DRUG MANUFACTURERS?

More than 250M cash pay prescriptions were filled in 2017. Amazon could capitalize on cash payments by offering cheaper prices to patients who pay cash for their medications through PillPack.

This is a good place to test the product, especially because cash pay prices vary greatly by pharmacy. In some cases, the cash price might even be cheaper than what's offered through a health insurer, which could give insured patients a reason to check Amazon first.

Beyond cash-paying patients, Amazon would need to invest in more costly parts of the pharmacy supply chain.

RETAILER	PRICE					TOTAL PRICE
	Pioglitazone (Actos)	Celecoxib (Celebrex)	Duloxetine (Cymbalta)	Atorvastatin (Lipitor)	Clopidogrel (Plavix)	
HealthWarehouse.com	\$12	\$22	\$13	\$10	\$10	\$66
Costco [1]	\$16	\$26	\$35	\$13	\$16	\$105
Independents [2]	\$19 (\$10-\$493)	\$34 (\$11-\$293)	\$31 (\$20-\$267)	\$15 (\$8-\$197)	\$15 (\$8-\$260)	\$107 (\$69-\$1,351)
Sam's Club [1]	\$20	\$38	\$31	\$20	\$45	\$153
Walmart	\$132	\$203	\$123	\$30	\$30	\$518
Kmart	\$160	\$185	\$120	\$35	\$35	\$535
Grocery Stores [3]	\$113 (\$10-\$349)	\$189 (\$46-\$230)	\$170 (\$10-\$223)	\$32 (\$19-\$71)	\$36 (\$1-\$224)	\$565 (\$88-\$1,107)
Walgreens	\$167	\$204	\$251	\$65	\$65	\$752
Rite Aid	\$255	\$194	\$170	\$128	\$119	\$866
CVS/Target	\$270	\$187	\$195	\$135	\$141	\$928

A price difference of 22.5x for the same drug

[1] Nonmember prices.

[2] Prices in parentheses are the ranges across sampled stores. Total price reflects the averages of the combined prices for the five drugs at individual independent pharmacies.

[3] Prices in parentheses are the ranges of the averages across sampled stores, including Albertsons, Food Lion, Giant Eagle, H-E-B, Hu-Vee, Kroger, Publix, and others. Total price reflects averages of the combined prices for the five drugs at individual grocery store pharmacies.

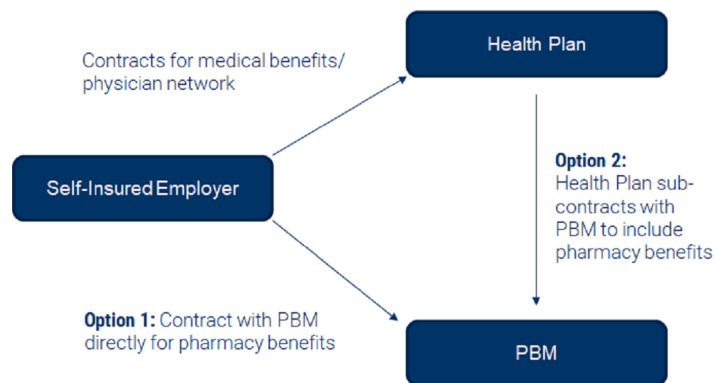
[Consumer Reports](#)

A logical next step would be to complement PillPack's mail order pharmacy with a way to fulfill same-day prescriptions. Amazon could do this by setting up a retail pharmacy and/or pharmacy distribution node from Whole Foods, or partner with independent pharmacies in areas where its presence isn't as strong.

Once Amazon has the pharmacy delivery system set up for the end patient, it can offer pharmacy benefits to payers that have traditionally been served by pharmaceutical benefits managers (PBMs).

These benefits have generally included developing a pharmacy network for patients, negotiating drug rates on behalf of small health plans and self-insured employers, monitoring anomalies in prescription fulfillment (e.g. poor medication adherence), and more.

A traditional relationship for employers, health plans, and pharmaceutical benefits managers (PBMs)



Employers are looking for alternatives to the existing PBM model. A National Pharmaceutical Council survey of 88 large employers found that only 30% understood their contract with their PBM, and nearly 70% would welcome an alternative to a rebate-driven business model.

Cigna's potential acquisition of Express Scripts means small health plans that compete with Cigna might also be willing to look at PBM alternatives. Amazon can offer the same functions traditionally serviced by PBMs to both of these groups, and can offer those services at near 0% margin since it doesn't need to make money on that business line alone.

But to be successful in this venture, it would make sense for Amazon to work alongside drug manufacturers to negotiate prices. It can also offer a service to them.

By 2023, every entity in the pharma supply chain will have to be a part of an interoperable tracking system, and every individual unit (i.e. a pill bottle) will need to be traceable from start to finish, as a result of the Drug Supply Chain Security Act (DSCSA).

Amazon has already filed for wholesale pharmacy licenses. Combined with the licenses it received from the PillPack acquisition, it only needs a manufacturing license to be able to transport drugs from end-to-end.

This would allow Amazon to handle products directly from a manufacturer, and relabel or split them up into different units as necessary. UPS already seems to be going down this route with its own manufacturing license.

With all the licenses and logistics pieces in place, Amazon could effectively operate an outsourced fulfillment system for drug companies similar to FBA, and handle all of the tracking requirements that the DSCSA demands.

One major link missing is a cold chain – or temperature-controlled logistics solution – which Amazon would need in order to transport any drugs that have specific environmental needs.

Amazon can start with easy-to-transport goods and eventually move into this area once it's made its inroads with drug manufacturers.

3

Amazon, claims management, and health benefits

ATTACKING CLAIMS MANAGEMENT

Only offering pharmacy benefits to employers would provide a solution to just one of the healthcare problems they face.

To be more effective, Amazon could become a platform for health benefits managements as well – which would mean it would need to delve into the world of claims management and billing.

The current system is made up of multiple steps, manual data entry/cleaning, and third party middlemen. The process is also slow – laws are in place to prevent claims processing and reimbursement from taking more than 30-45 days.

Claims management powers the payments back-end of the entire healthcare system.

New insurance solutions like Oscar and Collective Health saw the claims process as outdated and inefficient. As a result, many of the new tech-enabled carriers have invested significant resources into building their own claims management systems and infrastructure as a starting point.

“When we started Collective Health, we thought we would partner with a TPA [Third Party Administrator] to handle the ‘boring’ part around claims adjudication – which is a small, but important part of what we do. We went around the country to meet with dozens of TPAs, but we quickly realized the technology at the core of these businesses wasn’t capable of powering the transformation in the healthcare experience for members and employers we were creating.”

– Rajaie Batniji

CO-FOUNDER OF COLLECTIVE HEALTH

Amazon could potentially offer its own solution to this problem for payers.

The company has been working on an internal project called Hera, which involves taking data from electronic medical records (EMRs) to identify incorrect codes or misdiagnoses.

While there are obvious use cases here for population health management, this could also be a way for Amazon to start taking on some of the claims management functions, such as detecting inaccuracies in submission.

The project is said to have been in development for 3+ years, and is being pitched to commercial health plans.

FROM CLAIMS MANAGER TO BENEFITS MANAGER

Claims management software could be a white-label solution, and it also presents a lucrative opportunity for a benefits management solution for employers.

If Amazon can standardize and structure the payments and administration back-end of claims, that technology can power a benefits marketplace where service providers like pharmacies, wellness companies, PCPs, etc. can outsource the claims process to Amazon.

Amazon could then provide a platform to employers or small health plans, creating a distribution avenue for other health services. This creates an incentive for both sides of the marketplace to join with Amazon, utilizing back-end services as well as a front-end platform.



Amazon can also offer self-insured employers a common product usually purchased in conjunction with benefits managers: stop-loss insurance. This is a type of insurance product that self-insured employers tend to take to prevent against truly catastrophic scenarios.

Berkshire's specialty insurance subsidiary started offering this product in 2016, and Amazon could utilize that. This is similar to Collective Health, which is partnering with Sun Life Financial to offer stop-loss insurance.

4

Amazon and Medicare/Medicaid management

WHY MEDICARE/MEDICAID?

With several patient touch points across different settings (home, grocery store, online, etc.), Amazon could become a lifestyle manager for the Medicaid and Medicare populations.

There are 52M+ Medicare beneficiaries, 71M+ Medicaid beneficiaries, and 10M+ dual eligibles (people who have both).

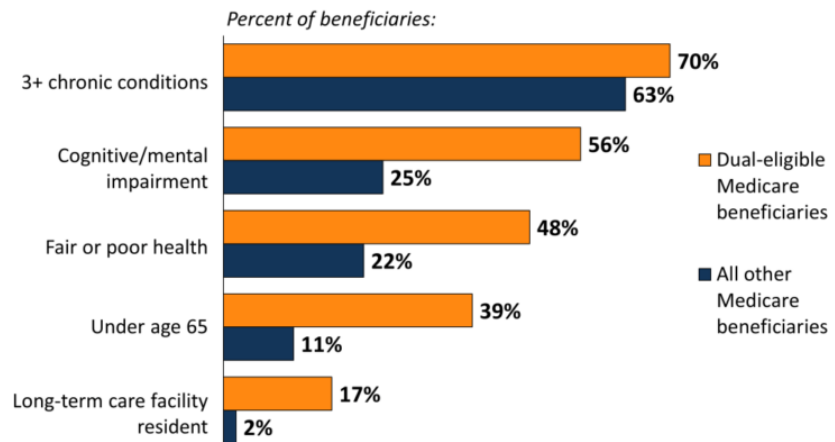
Spending for Medicare and Medicaid topped \$1.3T in 2017, much of which was concentrated in the sickest 10% of patients.

Many patients in this category have chronic diseases or mental health issues that require day-to-day lifestyle management. These are groups of the population where Amazon has the most room to grow its Prime Membership.

Penetration in income levels below \$68K per year is significantly lower than other brackets. Amazon also has far fewer Prime members above 55, especially compared to competitors like Walmart.

Figure 16

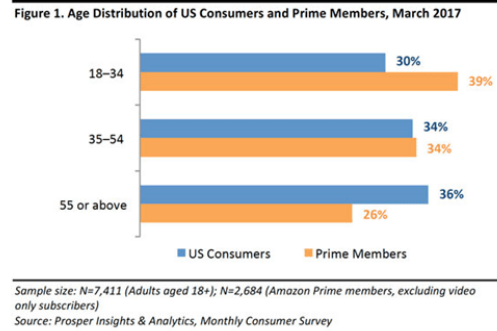
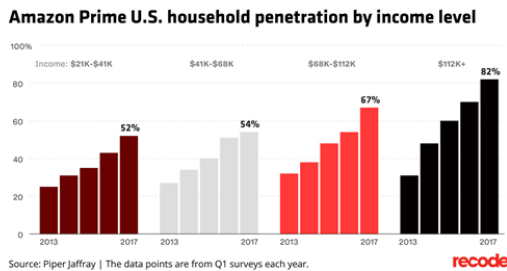
Comparison of Characteristics of Dual-Eligible Medicare Beneficiaries and All Other Medicare Beneficiaries



SOURCE: Kaiser Family Foundation analysis of the Medicare Current Beneficiary Survey 2010 Cost and Use file.



Amazon Prime has low penetration/higher growth prospects in low income and older populations



CBINSIGHTS [Recode, Prosper Insights](#)

Amazon would be entering at a particularly good time because the Centers for Medicare & Medicaid Services (CMS) has drafted proposals to expand coverage for Medicare.

The agency is looking closely at primary care, and looking to expand its definition to include social determinants like transportation, diet, home services, etc. It's also proposing new reimbursement rules to cover telemedicine-only visits for Medicare beneficiaries.

Amazon could leverage its position to take advantage of these changing Medicare rules and bring more people to Prime by providing attractive incentives.

The company has begun exploring the idea. VP of special projects Babak Parviz specifically highlighted this as an interest and took a cross country bus tour to do research. Atul Gawande has also written about treatment of the elderly, end of life care, and over utilization of healthcare as a whole in the elderly population.

Amazon was reportedly in talks with AARP earlier this year to figure out products and solutions for the company's members.

PRIME FOR GROCERIES AND HOME NEEDS

Amazon now offers Medicaid beneficiaries a discounted Prime membership, though it doesn't yet extend to Amazon Fresh or Prime Pantry discounts. This could change in the future – and we might even see the ability to use SNAP (supplemental nutrition benefits) on the site directly.



prime

Amazon's low prices with fast, FREE delivery and much more

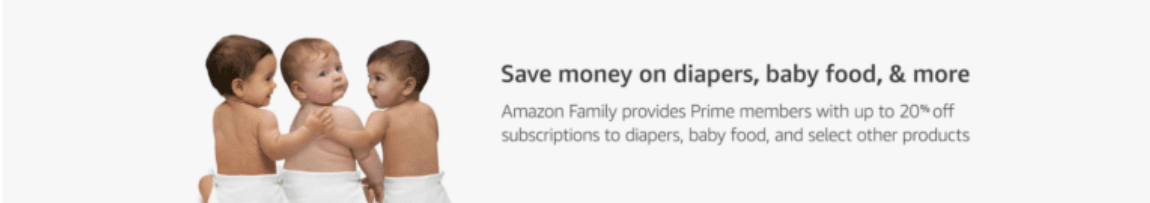
Prime is just \$5.99/month* for qualifying customers with an EBT or Medicaid card. Cancel anytime.

Get started

[EBT cards](#) are used for government assistance programs, such as Temporary Assistance for Needy Families (TANF). Medicaid cards are issued by states to qualified recipients.
Don't have an EBT or Medicaid card? [See other plans](#)

How to get started

- 1 Confirm eligibility
- 2 Sign up for Amazon Prime
- 3 Start using your Prime benefits

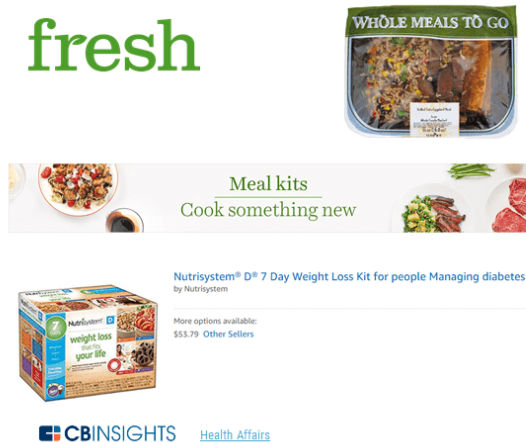


Save money on diapers, baby food, & more

Amazon Family provides Prime members with up to 20% off subscriptions to diapers, baby food, and select other products

*This offer does not include [household sharing](#) of Prime benefits. You may receive this price for up to 48 months and will need to qualify every 12 months.

Amazon can use meal tailoring to boost its Amazon Fresh and Pantry businesses



Meal Delivery Programs Reduce The Use Of Costly Health Care In Dually Eligible Medicare And Medicaid Beneficiaries

	Intervention group		Matched control group		Incidence rate ratio	
	Number	(95% CI)	Number	(95% CI)		(95% CI)
EMERGENCY DEPARTMENT VISITS						
Medically tailored meals program	0.63	(0.39, 0.88)	2.10****	(1.73, 2.47)	0.30****	(0.20, 0.45)
Nontailored food program	0.90	(0.74, 1.06)	1.59****	(1.31, 1.88)	0.56****	(0.47, 0.68)
INPATIENT ADMISSIONS						
Medically tailored meals program	0.27	(0.08, 0.46)	0.56**	(0.34, 0.78)	0.48**	(0.26, 0.90)
Nontailored food program	0.43	(0.33, 0.53)	0.49	(0.38, 0.60)	0.88	(0.69, 1.11)
EMERGENCY TRANSPORTATION EVENTS						
Medically tailored meals program	0.46	(0.19, 0.72)	1.60****	(1.12, 2.09)	0.28	(0.16, 0.51)
Nontailored food program	1.06	(0.73, 1.39)	1.70****	(1.15, 2.24)	0.62****	(0.49, 0.78)

The ability to cover food and groceries through Amazon could actually boost its meal kit business.

Offering disease-specific meal kits would be a huge benefit, especially for people in locations where access to fresh produce might be difficult.

Tailored meal kits for dual eligibles can reduce adverse health events, according to a recent study by Health Affairs. If Amazon wants to differentiate its meal kit offering, catering it to health needs for Medicaid and Medicare populations would be one possible tactic.

ALEXA CAN HELP WITH HOME CARE

Amazon can apply similar tactics to the smart home, which every tech giant is fiercely competing to own. Amazon may have larger market share, but its competitors are catching up.

One way it can take advantage of its head start and differentiate itself is by making its smart home technology medically useful.

Amazon's Echo — its voice-controlled speaker with video capabilities — is ideal for monitoring purposes, especially at home; but in order to handle medically relevant data, it must be HIPAA compliant.

The company posted a job opening for a HIPAA Compliance Lead as part of the Alexa Information group earlier this year, but the post has since been removed.

HIPAA Compliance Lead
Job ID: 602824 | Amazon.com Services, Inc.

[Apply now](#)

DESCRIPTION
The HIPAA Compliance Lead is an experienced HIPAA professional who will own and operate the security and compliance elements of a new initiative. You will work alongside product managers, software developers, biotech, and legal teams to ensure that our services are in compliance with HIPAA security and privacy requirements. Core responsibilities include:
- Creating a HIPAA security and compliance program to ensure that technology and business processes meet our HIPAA Business Associate Agreement (BAA) requirements, as well as all applicable federal and state laws, regulations and standards.
- Managing all aspects of the program, including employee education and training, monitoring and auditing, conducting and documenting investigations, addressing violations, and monitoring corrective actions.
- Tracking & reporting against the program's operational readiness goals, to ensure all milestones are met, and that blocking issues are escalated and resolved effectively.
- Delivering data analysis, metrics and executive dashboards for the program.
- Owning and managing stakeholder communications, providing status as needed and be the point of contact for questions and concerns.
- Maintaining the program's audit- and inspection-readiness posture.
- Monitoring relevant federal and state regulations, and modifying the compliance program to accommodate any changes.
- Acting as a consultative resource for health care regulatory matters.

Job details
Seattle, Washington
Alexa Information
Project/Program/Product Management-Non-Tech

Was removed after reporters saw the listing

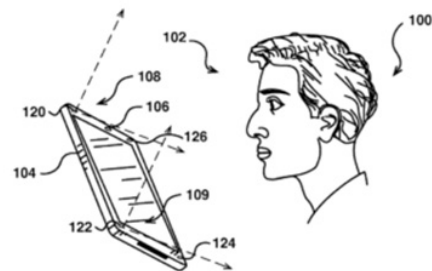
Share this job
f in t e

[GeekWire](#)

With HIPAA compliance, the company can go in several directions.

The Echo could be used to monitor adherence and give notifications about medications. Amazon also **has patents** for monitoring blood flow and heart rate through the camera, and could expand to fall detection or gait monitoring.

Amazon patent for facial recognition + heart rate analysis via cameras



Source: USPTO

The Echo could also be the hub for services like telemedicine, digital therapeutics companies, coaches, and more to help manage Medicaid/Medicare members in their homes.

Amazon is already looking into developing an ecosystem for third party healthcare applications for Alexa.

It funded the Alexa Diabetes Challenge. The Alexa app platform has lightweight healthcare apps from institutions like the Mayo Clinic and Libertana to answer medical Q&A, send alerts in emergencies, and help communicate with caregivers.

Eventually, Amazon could handle the back-end processes of HIPAA compliance and voice technology while providing the distribution and platform for companies through Alexa and the Echo.

Alexa can help manage home care and issues common to Medicare/Medicaid patients

THE ALEXA DIABETES CHALLENGE

Sponsored by Merck & Co., Inc., Kenilworth, New Jersey, U.S.A.



FINALISTS

Diabuddy	My GluCoach	PIA: Personal intelligent agents for type 2 diabetes	Sugarpod	T2D2: Taming type 2 diabetes, together
A virtual diabetes educator and at-home coach that is sensitive and responsive to the patient's mood, enhancing patient skills for self-management.	A holistic management solution that blends the roles of voice-based diabetes teacher, lifestyle coach, and personal assistant to serve the individual and specific needs of the patient.	A connected care intelligent agent that uses machine learning AI technology integrated with IoT device data to encourage healthy habits, detect at-risk behaviors and abnormalities, and alert care teams.	An interactive, multi-modal diabetes care plan solution that provides tailored tasks based on patient preferences, delivered via voice, mobile, video, and web. It includes a smart foot scanner.	A virtual nutrition assistant that uses machine learning to provide in-the-moment personalized education and recommendations as well as meal planning, and food and glucose logging.

CBINSIGHTS Alexa Diabetes Challenge, Alexa App Store

Development of Third-Party Alexa Apps



Allows seniors to verbally report medical data, get exercise and adherence reminders, call a caregiver, and coordinate transport



Mayo Clinic First Aid

"Tell me about spider bites"

"Help for a burn"



Ask My Buddy

"Alexa, ask My Buddy to alert everyone."

CLINICS COMING SOON?

Amazon could also bring healthcare to the physical world and establish its own clinics.

The company recently hired Martin Levine, former medical director for Iora Health in Seattle. Iora focuses on creating clinics and primary care services specifically for Medicare beneficiaries.

A quick way for Amazon to distribute clinics would be to establish them in Whole Foods, where it already has a retail footprint. Whole Foods CEO John Mackey talked about this to Bloomberg:

*“[Whole Foods CEO, John Mackey’s] second idea is even more grandiose: a **Whole Foods medical clinic**. He says he was inspired by Rosen Care, an employer health-care program run by Rosen Hotels & Resorts in Orlando, which offers employees an on-site company-owned medical facility. The clinic has a staff of 38 health-care practitioners serving 5,300 employees and places an emphasis on nutrition and preventive medicine, which company founder Harris Rosen says has reduced his per-employee health-care costs to about half the national average. Mackey met Rosen at a health-care conference last summer in Las Vegas, then traveled to Florida to tour the clinic. **He’s considering rolling out Whole Foods clinics to employees—and even, perhaps, to customers.**”*

Amazon could test and tweak the clinic concept within Whole Foods stores before establishing other clinics in higher Medicare/Medicaid density areas. This would look similar to companies like Cityblock Health or Oak Street Health.

5

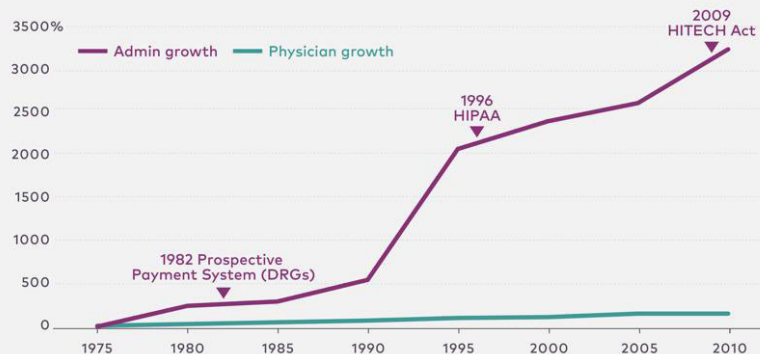
Amazon and providers

THE BACKWARDS INTEGRATION STRATEGY

Amazon is also examining ways it can be useful to existing physicians, hospitals, and providers.

In the last few decades, healthcare has hired more people for administrative jobs, many of which involve coordinating information between different parties and data entry/cleaning.

Healthcare administrators far outpace physicians in growth



Source: athenahealth analysis of data from the Bureau of Labor Statistics, the National Center for Health Statistics, and the United States Census Bureau's Current Population Survey

Some point to regulations that require extensive tracking and noting of services rendered as the catalyst for this administrative increase.

Instead of investing in modern technology systems as a solution, many institutions in healthcare prefer to hire more people since the upfront cost is lower, the implementation is faster, and it's easier to adapt their workforce if regulatory requirements change.

Amazon has the opportunity to reduce the burden for users and build a new back-end for providers. Instead of attempting to disrupt the existing processes, it might make more sense for Amazon to pursue a backwards integration strategy, outlined below.

By offering a more intuitive layer on top of the existing system/ process, Amazon can aggregate more users to its user interface and slowly replace the very manual back-end processes over time.

AMAZON + HEALTH IT

Potential strategy to get into providers



CBINSIGHTS

ALEXA AND THE MEDICAL RECORD

Amazon is reportedly looking into ways data can be pushed into and pulled from EMRs.

Voice is an increasingly popular interface, and could be particularly useful in healthcare, as there are lots of hands-free scenarios.

Hospitals are already exploring the use of voice applications today.

Premier Health, which has five hospitals and two major health centers, spent \$1.6M to implement voice recognition software that integrated with Epic, a developer of an EMR system. In the first year, it estimated that doctors' clicking fatigue had reduced and saved them 90 minutes a day. First-year savings for Premier Health were ~\$1.3M thanks to more efficient workflow.

There are several Alexa experiments happening in hospitals around the country, including Northwell, Mass General, and Boston's Children's Hospital.

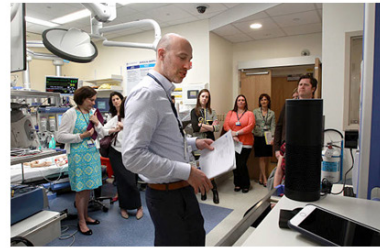
However, because Alexa is not yet HIPAA-compliant, the tasks completed with the software are generally limited to non-identifiable uses, such as checklists for surgeons, disease and drug information for patients, and hospital information.

If Alexa does become HIPAA-compliant, the use cases could expand much further.

ALEXA IS ENTERING THE HOSPITAL

"We definitely need to make that transition into the HIPAA-compliant framework before we can build out fully-enabled skills that have all the patient's health information on demand.

"I'd say there's definitely a future vision of voice being able to drive a lot of the interface or interactions that clinicians have with the medical record and other reference data sets around patient information, just because it's such a deep amount of information you have to process about a patient...Pulling those things via voice commands is really powerful and I think that's probably the future of voice in healthcare."



-Matt Murphy, ex-Digital Health Innovation Lead at Boston's Children's Hospital

[MDDI Online](#)

CBINSIGHTS

Most doctors find the EMR process inefficient and time-consuming, as it requires medical professionals to manually take down information. Alexa could integrate into EMRs and become a passive note taker during visits.

Over time, Alexa could help shift Amazon from a middleware that populates an EMR system into an EMR itself.

Several startups are entering the voice space with this strategy in mind.

Products like Dragon Medical have been around for some time, while new companies like Suki, Notable, and Saykara have raised more funding recently and could be potential acquisition targets.

COMPANIES WORKING ON VOICE + EMRS



Funding

\$20M

Suki is a virtual scribe that can input data into the EMR via voice. Alexa could potentially do something similar, and in the process build the pipes into its own EMR offering.

Select Investors

Social Capital, Venrock, First Round Capital

SIMILAR COMPANIES

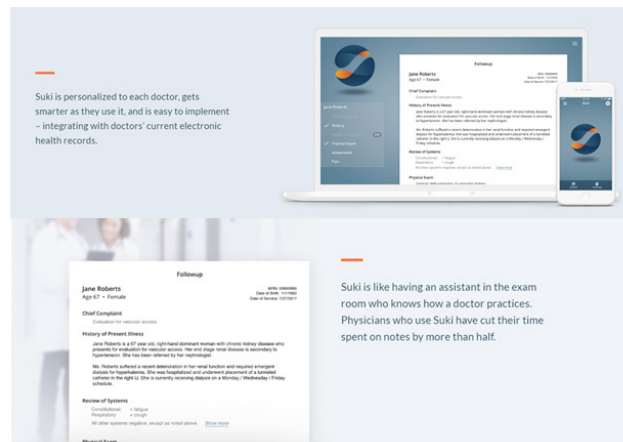
Dragon Ready

saykara

m³Modal

notable

CBINSIGHTS



Source: Suki

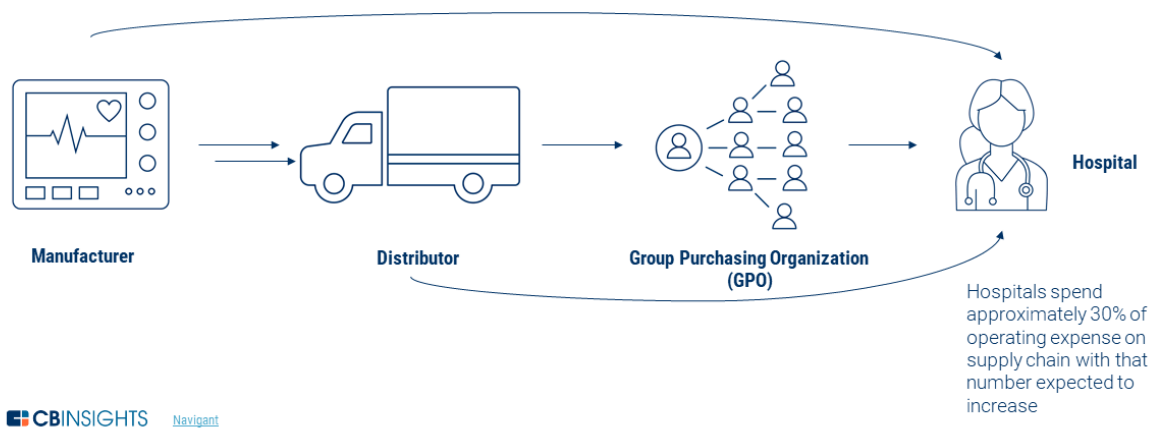
AMAZON THE B2B (AND B2C) SUPPLIER

Like the pharmacy, the supply chain is currently convoluted and filled with middlemen. Manufacturers deal with distributors, who deal with group purchasing organizations (GPOs) that negotiate on behalf of hospitals to bring the costs of supplies and technology down (though sometimes hospitals negotiate directly).

After labor, the supply chain is hospitals' second-largest expense, and it's expected to grow in the near future.

AMAZON + HEALTH IT

Hospital supply chains are expensive and middleman heavy



CBINSIGHTS Navigant

Amazon already partially services this area: its B2B unit has a healthcare division that mostly deals with low-risk commodity products (one reason being that they don't yet have a cold chain operation in place).

Because Amazon doesn't offer everything yet, hospitals can use existing distributors that can handle all of their needs and already have a process in place. Many hospitals have stakes in these GPOs, which further lessens their incentive to switch to a new system.

Amazon is going to have trouble immediately delivering cost savings to its customers. New York Presbyterian CEO Steven Corwin mentioned in a recent interview that the company was unable to deliver better pricing to the hospital.

But the metrics of success are changing. Chris Holt, who leads Amazon's B2B supply division, spoke to HealthcareDive about reducing labor costs, creating a better interface, and building tech to integrate backwards into existing systems and processes.

NEW METRICS: PRODUCTIVITY, INTERFACE, AND BETTER PROCUREMENT

Amazon Business claims a number of their healthcare customers have **seen their labor costs cut by more than half** – and it's not just big hospitals they are going after

“When an employee sits down at work, and they see Amazon, they already know exactly what to do – **they don't even need to be trained...**”

The procurement tools often feed back into an ERP (enterprise resource plan) or financial system that has a very standardized general ledger that does really well when it's a repeat order, but isn't very good at anything new,” Holt said. “We've been building technology to **integrate backwards into all of these systems**, even to enable EDI (electronic data interchange) transactions,” allowing Amazon's system to fully interact with the healthcare system's.”

Chris Holt, Global Healthcare at Amazon

[Healthcare.Dive](#)

 CBINSIGHTS

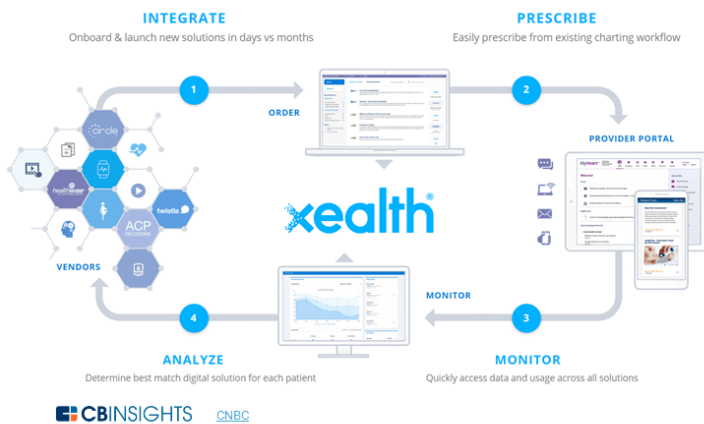
Amazon is selling increased efficiency and backwards integration to get more users onto the system, which can attract more suppliers that might have better deals, which can then help Amazon build out its marketplace functionality.

Over time, the company would be able to replace more of the back-end ordering processes and potentially get better deals than existing GPOs.

Amazon could also focus on the consumer side of medical supplies along with its pharmacy strategy. The company could handle delivery and communication between doctors and patients post-diagnosis.

It recently announced a partnership with Xealth – which is already integrated into several EMRs and hospitals – to allow physicians to order medical supplies on behalf of their patients. Xealth also lets doctors prescribe digital goods like diabetes management programs and relevant content or regimens for specific diseases.

Amazon could also go the consumer route for medical device delivery and monitoring



amazon

The physician can order all the supplies the patient needs directly for the patient powered by Amazon as well as prescribe digital goods and monitor a patients progress

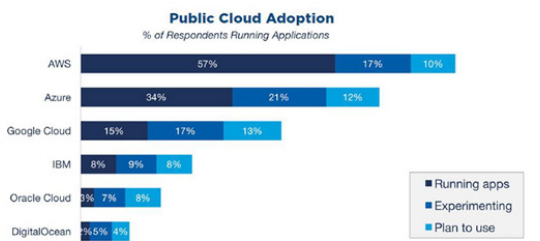


Amazon, the healthcare cloud, and the lab

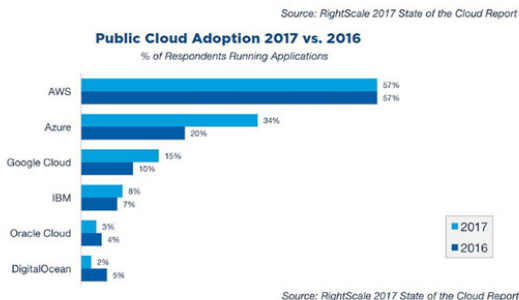
THE HEALTHCARE CLOUD

Amazon's existing AWS infrastructure is critical to the success of many of its healthcare initiatives. With more tech giants trying to expand their cloud platforms, this has become a competitive space.

Each of the tech giants sees healthcare as a high growth area for cloud sales due to the vast amount of data being produced, and the need for high performance computing to make sense of it.



The cloud wars between tech giants continue to increase. Amazon has a lead but is seeing competition from Google and Microsoft, both of whom are focusing on their healthcare cloud offering. The space is estimated to grow above \$10B in North America alone in the next few years according to our market sizing tool



Markets	Analyst Consensus
Healthcare Cloud Computing	\$14.82B
+ Global (11 est.)	\$14.82B
- North America (2 est.)	\$10.20B
Healthcare Cloud Computing - North America	
Healthcare Cloud Computing	12.3% CAGR by 2022
Healthcare Cloud Computing	12.3% CAGR by 2017

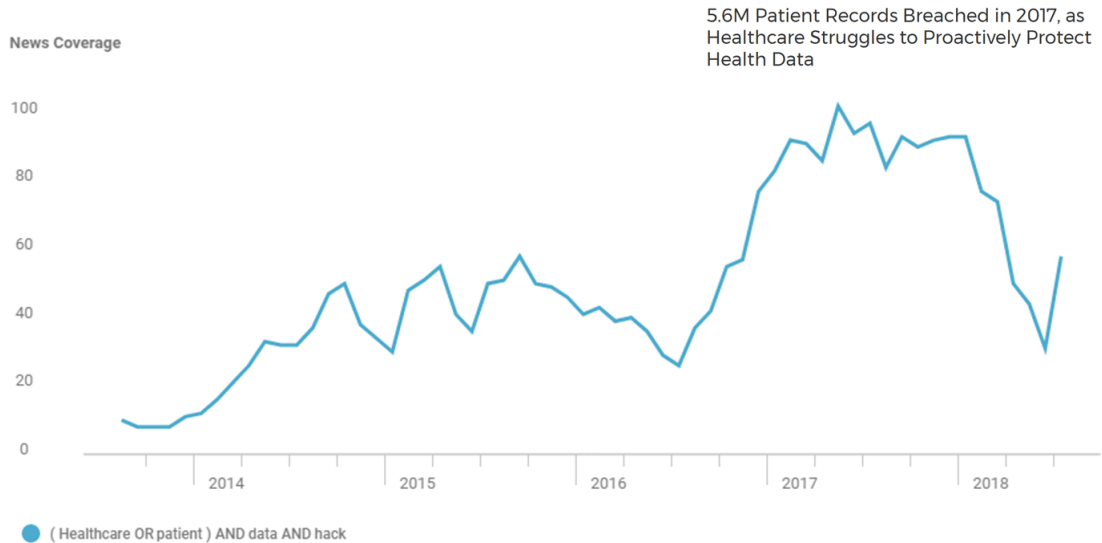


Amazon offers several AWS solutions for existing healthcare companies already, especially in security and compliance.

This has been an especially hot topic, as 2017 saw large scale hacks of identifiable datasets (which included Social Security numbers, among other personally identifiable information), and several hospitals were the target of ransomware attacks.

With data safety being an ongoing concern for cloud migration, these attacks demonstrate the flaws in on-premise storage that could be a catalyzing moment for healthcare giants.

News Coverage



Amazon can capture more of the healthcare cloud market by offering specific solutions for the different entities in the space. Several of the initiatives described above would likely be powered by AWS, including claims management, patient monitoring, electronic medical records, and supply chain management software.

AWS is focusing heavily on its genomics, which is becoming relevant to payers, providers, researchers, and everyone in between. Thanks to the falling cost of sequencing and the increasing amount of screening and usage in clinical settings (e.g. tumor profiling), the demand for computing power and storage to analyze these datasets has grown.

One way Amazon is doubling down on this space is through participating in **GRAIL**'s \$900M+ Series B financing.

GRAIL is attempting to detect cancer earlier by monitoring circulating tumor DNA in the blood stream. The company gives Amazon a potential customer that produces a lot of genomic data and complex analysis tools, and a case study to possibly acquire more customers.

With the investment in GRAIL, Amazon is getting a customer and a case study

GRAIL

Funding 7 Fundings / \$1,614M

DOWNLOAD CSV Please select items to export

Date	Round	Amount	Investors	Valuation	Sources
5/22/2018	Series C	\$300M	6 Dimensions Capital, Ally Bridge Group, and 8 more		5
1/11/2018	Series B - IV	\$3.06M	ARCH Venture Partners, and Kleiner Perkins Caufield & Byers		1
11/22/2017	Series B - III	\$238.35M	ARCH Venture Partners, and Kleiner Perkins Caufield & Byers	Deal Terms	1
4/26/2017	Series B - II	\$59.23M	ARCH Venture Partners, Dentsu Ventures, and Kleiner Perkins Caufield & Byers	Deal Terms	2
3/1/2017	Series B	\$914.02M	Amazon, ARCH Venture Partners, and 7 more	Deal Terms	10
1/11/2016	Series A	\$100M	ARCH Venture Partners, Bezos Expeditions, and 4 more	\$469M	4
1/9/2016	Spinoff / Spinout		Illumina		1

The scale of GRAIL's data set

From the laboratory to the clinic, GRAIL aims to produce the highest-quality data and transform it into clinically actionable insights. Our high-intensity sequencing assays will yield approximately one terabyte of data for every individual, creating datasets of unprecedented scale in modern clinical medicine.

We are deploying, at scale, the latest tools of data science, including powerful approaches from machine learning such as hierarchical neural networks. We intend to apply such methods to the ultimate problem of classifying patients according to the presence, type, and severity of cancer, and in all steps of our data-generating pipeline.

AWS AND THE LAB STARTUP

Amazon to expand its footprint in the lab via AWS. It already offers several AWS solutions for pharma and biotech companies, and could expand the services – especially to earlier stage labs and biotech companies.

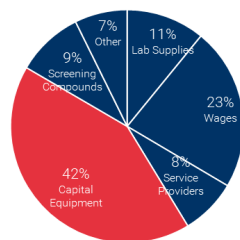
Amazon has allowed small companies to outsource the massive upfront costs associated with running data centers by allowing companies to rent their usage without having to buy.

Many labs and small biotech companies face large upfront equipment and lab costs. As companies scale, significant amounts of their budget go to outsourced services as well.

Amazon could take these costs upon itself and act as a back-end lab.

Amazon can drop the cost for small labs the same way AWS did for tech startups

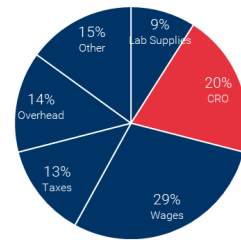
Perlara PBC's 2014 expense report



Large fixed costs in the form of capital equipment exist for early stage biotech startups

Amazon can outsource those fixed costs, similar to what it did with datacenters for AWS

Perlara PBC's 2016 expense report



Outsourced services to clinical research organizations (CROs) become a major cost component as companies scale.

Amazon can facilitate the market place for these companies to compare and shop for services

CBINSIGHTS [Perlara Open Finance](#)

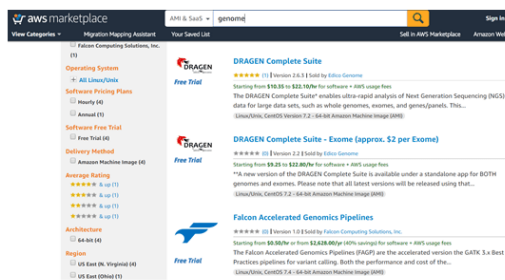
This is comparable to how some companies like Transcriptic and Emerald operate for cell models. Companies like Vium are creating the building blocks to do this for mouse models.

AWS for labs could allow companies to send in the samples, run assays, and then receive analyzed and raw data (powered by AWS). This would allow companies to use equipment only as needed, especially at the early stages when capital is scarce.

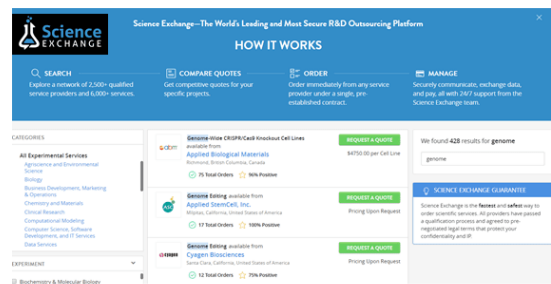
Among the benefits, Amazon could also develop relationships with companies early on and offer more services as they scale up. This could be its marketplace for AWS services, or it could expand to a marketplace for other outsourced research services similar to Science Exchange. By doing this, Amazon could make it much easier for small labs to get running, identify customers for its services as it scales up, and become the AWS for biology, chemistry, etc.

Amazon can facilitate the marketplace for other services as well

AWS marketplace



Marketplace for other CRO services



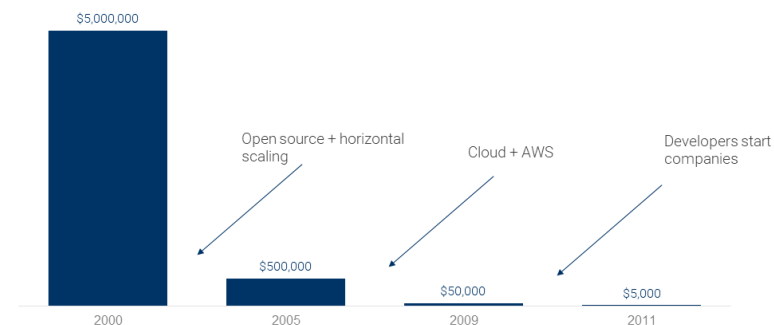
CBINSIGHTS AWS marketplace, Science Exchange

AWS allowed many early-stage tech companies to take off – Amazon can capture similar value if it helps small labs to start and grow the same way.

Can Amazon recreate this for the lab?

Amazon can allow small labs to outsource fixed costs to them while also building a marketplace and finding future AWS clients through the process

Costs to launch an internet tech startup (approximately)



CBINSIGHTS Both Sides of The Table

7

Conclusion

Amazon's potential foray into healthcare has already caused players in the space to scramble and reevaluate their core competencies.

While Amazon has barely scratched healthcare's surface, it has the potential to upend the space with its e-commerce expertise. Without the need to make money in healthcare, the high margin and convoluted parts of the healthcare business are ripe for disruption.

Amazon's approach allows other companies to outsource parts of their businesses that are messy and outside their main focus. This can happen on multiple fronts, impacting:

- **Payers** – Amazon can handle the claims and marketplace so companies can focus on offering their services.
- **Providers** – Amazon can handle documentation into the EMR or coordinating buying and transporting supplies.
- **Pharma/Biotech** – Amazon can run the actual experiments so researchers can focus on experiment design and analysis; or Amazon can handle the packaging, tracking, and transportation for larger drug manufacturers.

As healthcare becomes a deeper quagmire of middlemen and profit extraction, Amazon is particularly well-positioned to change the space.

Despite various obstacles, including market leaders, established processes, and general risk-aversion of buyers to new players, its entrance will either change how the system is designed or force existing players to become more competitive.