Ministry of Foreign Affairs

NYC: The Life Sciences and Health Sector in the Age of COVID-19

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April 30, 2021

I. Executive Summary:

This report details the empirical basis of the strengths of New York City as an economic location, as an established US life science and health center, and as a location of value to Dutch healthcare and wellness companies. The report concludes that:

1. New York City (NYC) is an economic location of outsized value to Dutch companies and merits resources both from the Government of the Netherlands and Dutch companies to undertake market entry in multiple sectors;

2. NYC is a considerable market opportunity within the US Life Sciences and Health (LSH) sector for potential Dutch entrants and demonstrates relative advantages vis-a-vis other US LSH centers;

3. There are clear paths for Dutch LSH companies to more efficiently engage with key NYC market participants, as well as with those in the larger New York State (NYS), and enter this market;

4. NYC's LSH sector's strengths include its matchless scale (with commensurate purchasing power), its strong public and private healthcare medical facilities infrastructure, its vibrant LSH research and development ecosystem, its exceptional access to LSH investment capital, its robust pool of highly skilled medical professionals in most disciplines, and its access to innovative LSH technologies and LSH tech companies of every stripe.

5. Key interlocutors for the Government of the Netherlands and its LSH companies should include the Government of the City of New York and its NYC Health+Hospital, the State of New York and its Department of Health, the network of NYC private hospitals and health systems, the constellation of NYC medical research facilities, the Partnership Fund for NYC and the NY eHealth Collaborative, the vibrant NYC LSH venture capital community, and the community of NYC innovation and research institutions, among others.

6. The Government of the Netherlands' three identified LSH subsectors of a) digital transformation of healthcare, b) accessible medical technologies for sustainable health and care, and c) strengthening health care systems match many of NYC's current demands and market opportunities. Of these three, digital health and strengthening the health care systems may be the most currently opportune targets, as the demand for digital health capacities in NYC is skyrocketing, and

both the public (NYC and NY State) and private healthcare systems (hospitals, community-based facilities, et al) are at this moment reassessing their structures. They are now seeking to update and revamp their capacities, having had their limitations brutally revealed by the pandemic.

7. A central conclusion of this report is that the COVID-19 pandemic and its consequences have become the most important drivers of the NYC/US LSH sector. Dutch LSH companies should adjust and emphasize the COVID-19 relevance of their products and services, even if that is not their primary purpose, to maximize their probabilities of creating collaborations and winning US sales;

8. NYC's current rebuilding/reinforcement of its public healthcare system and its major private hospitals offers an excellent opportunity for engagement and sales by Dutch LSH firms. Both NYC's public and private sectors are reassessing their systemic healthcare elements, having just experienced their limits. As this includes (but is not confined to) the largest public healthcare system in the US, this is a unique opportunity for the Government of the Netherlands and Dutch firms to participate in this fundamental LSH reassessment and access any subsequent procurement opportunities.

9. This is also a key opportunity for the Government of the Netherlands and the City of Amsterdam to engage directly with the NYC and NYS governments, to collaboratively share information and potential solutions for municipal LSH infrastructure upgrades and innovations in response to the pandemic. Both NYC and NYS will likely recognize and appreciate the conclusions of another global capital having just survived and adapted to the same catastrophe, as well as the wider perspective of a national government coping with the wider effects of COVID-19.

10. The sheer scale of NYC's LSH human capital and personnel among LSH different disciplines reveals the breadth of wider business and recruitment opportunities for Dutch firms. In 2019, 799,600 people were employed in NYC's Healthcare and Social Assistance sector; this would be some 70% of Amsterdam's total population of 1,149,000. NYC is home to America's largest talent pool, at over four million, with roughly 3.2 million New Yorkers holding a bachelor's degree or higher—more than Los Angeles, San Francisco, Philadelphia, DC, and Boston combined.

11. NYC's LSH tech sector is vibrant and valuable: NYC was ranked the fourth best life sciences startup ecosystem in the world in 2019 (Amsterdam was 15th).

12. US LSH regulatory flexibility is currently at its highest foreseeable level. Many federal agencies (such as the Food and Drug Administration, the Environmental Protection Agency, and the Center for Disease Control) and state and municipal regulatory authorities have suspended their normal certification and regulatory procedures during the pandemic and have adopted expedited protocols. Thus, Dutch companies that require US LSH regulatory approval at any level should immediately apply for it.

13. One of the most important US LSH regulatory changes has been the federal Medicaid and Medicare programs temporarily permitting the coverage and reimbursement of telehealth medical visits for Americans that do not take place in a licensed medical facility (previously, this was not permitted). This has operationally legitimized telehealth for multiple uses across the United States. However, virtual doctor visits are not currently reimbursed at the same level as in-person visits by health insurance, raising potential fiscal consequences for medical institutions that offer telehealth.

14. NYC is the second largest center for US venture capital LSH investment deals (particularly in digital health) after San Francisco;

15. That both NYC and NYS have clear specific digital technology needs, revealed by the pandemic. Perhaps the most pressing is the need for a city- (or state-) wide digital tracking and organizational system that would permit contact tracing, organizing vaccination visits, tracking vaccinated people, scheduling booster shots, as well as preparing for a future pandemic. Other digital technology demands could include advanced telehealth solutions, cost reduction technologies and services, and wearable technology for the premium market;

16. NYC's Artificial Intelligence sector is vibrant and growing; there may be potential for Dutch firms to collaborate with NYC institutions and companies on research and contracts for AI-targeted LSH products. This subsector is currently in the process of developing itself commercially, though NYC is acquiring significant LSH-oriented AI infrastructure in terms of institutions, capital, and high-level AI tech talent.

17. There are considerable opportunities for Dutch firms to offer innovative new technology solutions to NYC hospitals/health systems, or to assist them to update their current outdated systems. These hospitals/systems are large, so these opportunities would be of scale.

18. It is critical for Dutch firms to adapt their technologies to US privacy standards, particularly to the US HIPAA standards, in order to compete in the NYC market. In this regard, GDPR adherence could become a competitive and market disadvantage to Dutch firms wishing to sell to US clients. For this reason, Dutch companies may wish to create US privacy-compatible digital capabilities housed entirely in the US, so as not to require GDPR compliance.

19. Many traditional, influential, and sector-wide NYC-based LSH events have currently been canceled, postponed, or converted to virtual formats. Participation in these replacement virtual events will certainly be constructive and convenient (no travel required). However, they will likely produce a suboptimal result in one of the key goals of the participants, i.e. the creation of credible networking and substantive connection formation. To access the NYC LSH sector, Dutch firms will have to visit NYC in person.

20. A key commercial target for Dutch LSH firms should be the NYC public health system, NYC Health+Hospitals. As the largest public health system in the US, winning it as a client would be very beneficial, as would the attendant (and considerable) prestige for supplying them.

21. A second key commercial target for Dutch LSH firms should be the major NYC hospitals; Dutch firms should attempt to engage with them in collaborations.

22. A third commercial target should be the active NYC venture capital firms that invest in the NYC LSH sector. These can serve as sources of capital to Dutch firms, a source of sales to the VC's portfolio companies, and also a source of cutting-edge information about NYC's LSH ecosystem.

23. An important potential source of collaboration and information are the many NYC LSH research facilities and universities. These will likely yield the future of the NYC LSH ecosystem, so engaging with them early will permit Dutch companies a view of the future of one of the most lucrative LSH centers in the world.

II. New York City: A Premier Economic Location

New York City and its five boroughs (Manhattan, Queens, the Bronx, Staten Island, and Brooklyn) pose a clear market opportunity for Dutch companies in general and Dutch LSH companies in particular.

Internationally, New York City is the world's highest ranking global city, the global financial capital, the global media capital, the global fashion capital of the decade, the world's second most vibrant global tech startup ecosystem, and a global cultural capital.

NYC is a deeply international city. The city's workforce is 45% foreign-born, originating from over 150 countries, with over 200 languages spoken in NYC. Nearly half of New Yorkers speak a language other than English at home (48.9%), nearly 1 in 4 residents speak Spanish at home (24.3%), and nearly two million people aged 5 years of age or older (25%) speak a language other than Spanish and English at home.

NYC's US economic primacy stems from its identity as the key US center of wealth creation, resident affluent constituencies, highest level human capital industries, unmatched public, cultural, and artistic institutions, and unrivaled domestic urban population scale and purchasing power. It attracts capital (financial and human), people, institutions, and opportunities as few other locations on earth.

NYC is home to the nation's largest talent pool, at over four million people, with roughly 3.2 million New Yorkers holding a bachelor's degree or higher — more than Los Angeles, San Francisco, Philadelphia, DC, and Boston combined. This is both a resource that can be tapped, as well as a market to supply.

Critically, NYC also serves as the evangelical hub for American culture, media, and, most relevantly, health care. What starts in New York often spreads across the US.

NYC's economic position as the largest, densest, and most affluent US urban center sets it apart and this relative domestic economic dominance currently remains unchanged. However, on account of its unmatched size and density, NYC has been more deeply damaged by the COVID-19 pandemic more than any other US city. Thus, NYC's economy has been more affected and requires a greater recovery and transformation than any other US location. This presents a tremendous opportunity for Dutch firms to participate both in the recovery and the innovation that will accompany it.

In 2019 (pre-COVID), NYC's population was 8,337,000, 2.5% of the total US population (and 48.1% of the population of the Netherlands). Its 2019 GDP was $1.065 trillion (17.4% larger than the Netherlands' 2019 GDP). It enjoyed 12% job growth from 2015-19, compared to 8.6% nationwide, demonstrating that NYC often grows faster than the rest of the United States. Its 2019 median household income was $69,000 (6.2% higher than the US median of $65,000) and 39.2% of its population were older than 25 years with at least a university Bachelor's degree (compared to the US average of 33.1%). Its real estate prices were outsized, with a 2019 median home price of $650,000 (the US average was $230,000).

NYC is exceptionally dependent on wealthy residents to maintain its tax base and fund its public services. In 2018, the top 1% of earners made up 42.5% of total NYC income tax collected ($5 billion). It is also these affluent residents that consume the cutting-edge medical services and products offered by the NYC LSH ecosystem, providing a defined market and a source of venture capital for further LSH innovation.

For companies entering the NYC market at this time, it is important to recognize that COVID's economic effects on NYC are deep, painful, and will take time to heal. Many NYC jobs are/were heavily dependent on industries devastated by the pandemic: leisure and entertainment, travel, tourism, and trade. It is projected that NYC employment fell by 662,000 jobs from Q4 2019 to Q4 2020, a 14.1% decline. Tourism, one of NYC's most important industries, is expected to attract 38 million visitors in 2021, up from about 23 million in 2020, but still some 40 percent lower than the record level of 66.6 million in 2019. Tourism-related spending dropped by 73% from 2019 to 2020, costing NYC $1.2 billion in tax revenue (59% of NYC's $2 billion drop in tax revenues).

Seasonally adjusted New York City private employment grew to over 3.5 million in March 2021, an increase of 42,000 (1.2%) from February, with 16,000 jobs added in accommodation and food services. The City of New York added more jobs in March 2021 than any state except California and Texas. In March 2021, NYC private employment remained 578,000 below pre-pandemic highs of February 2020, but has grown by 324,000 since the shutdown of April 2020.

NYC's fiscal position has been similarly affected. The city's projected 2020-23 tax revenues are estimated to fall by $11.3 billion, resulting in a city government shortfall of 4.2 percent. The NYC economy is however expected to recover, with GDP rising by 3.9 percent in 2021 and 3.3% in 2022.

Of course, this says nothing of the terrible human cost of COVID-19. As of April 26, 2021, 32,392 New Yorkers had died of COVID-19, there were 907,607 confirmed cases of COVID-19, and 3,408,878 New Yorkers (40.9%) had been vaccinated. Experts now project that NYC will reach the 65%-80% vaccination rates necessary for herd immunity by the end of 2021, if not sooner.

Thus, the current NYC economic situation is one of a towering global market responding to a serious structural blow and engaging in a slow but steady recovery. Certain elements of the local market will recover faster than others. It will remain the most vibrant single urban market in North America.

III. The US Healthcare Sector

To understand the scale and influence of the NYC LSH ecosystem, it is helpful to have some perspective on the larger US healthcare market.

Comprising both private and public elements, the US maintains a state-based patchwork of health insurance coverage that is non-comprehensive. Income, age, and race/ethnic identity often play roles in the extension of health coverage.

Unlike the Netherlands, the United States does not automatically provide health insurance coverage for all of its citizens. In 2019, 33.2 million Americans of all ages (10.3%) had no health insurance. Private insurance coverage is predominant: 61.3% of those covered had private coverage, while 37.4% had public coverage. Adults 18-64 were the most likely to lack coverage (14.7%), followed by children aged 0–17 years (5.1%). Seniors (adults aged 65 and over) were the most likely to have public coverage (i.e. Medicare, see below), and 96.0% of them did have it, followed by children aged 0–17 years (41.4%) and adults aged 18–64 (20.4%). Adults aged 18–64 (66.8%) were the most likely to have private coverage (often through an employer), followed by children aged 0–17 years (55.2%), and adults aged 65 and over (49.1%). Finally, the total level of US health insurance coverage is projected to decline, from 90.6% in 2018 to 89.4% in 2028.

The two giant institutions of US public healthcare are Medicare and Medicaid, which affect nearly every aspect of care and cost of the entire US healthcare sector. Medicare is the US federal/national health insurance program that provides coverage primarily to people over 65, irrespective of income, and functions the same way across the country. By contrast, Medicaid is a federal medical assistance program that serves low-income people of every age, it is a federal-state program and varies state to state, as it is run by state and local governments within federal guidelines.

In 2019 US health expenditures increased by 4.6% to $3.8 trillion, 17.7% of US GDP, and $11,582 per capita (compared with Germany's $5,728). This spending was distributed as follows:

- 31% on hospital care;
- 20% on physician and clinical services;
- 10% on retail prescription drugs;
- 5% on residential and personal care services;
- 5% on nursing care facilities and continuing care retirement communities;

This spending was directly provided by the following actors:

- 31% was provided by private health insurance;
- 21% by Medicare;
- 16% by Medicaid;
- 11% by personal out of pocket spending;

The ultimate providers of these funds (while private insurers might initially pay for a service, families or businesses pay the monthly premiums and the federal and state government often reimburses costs) were:

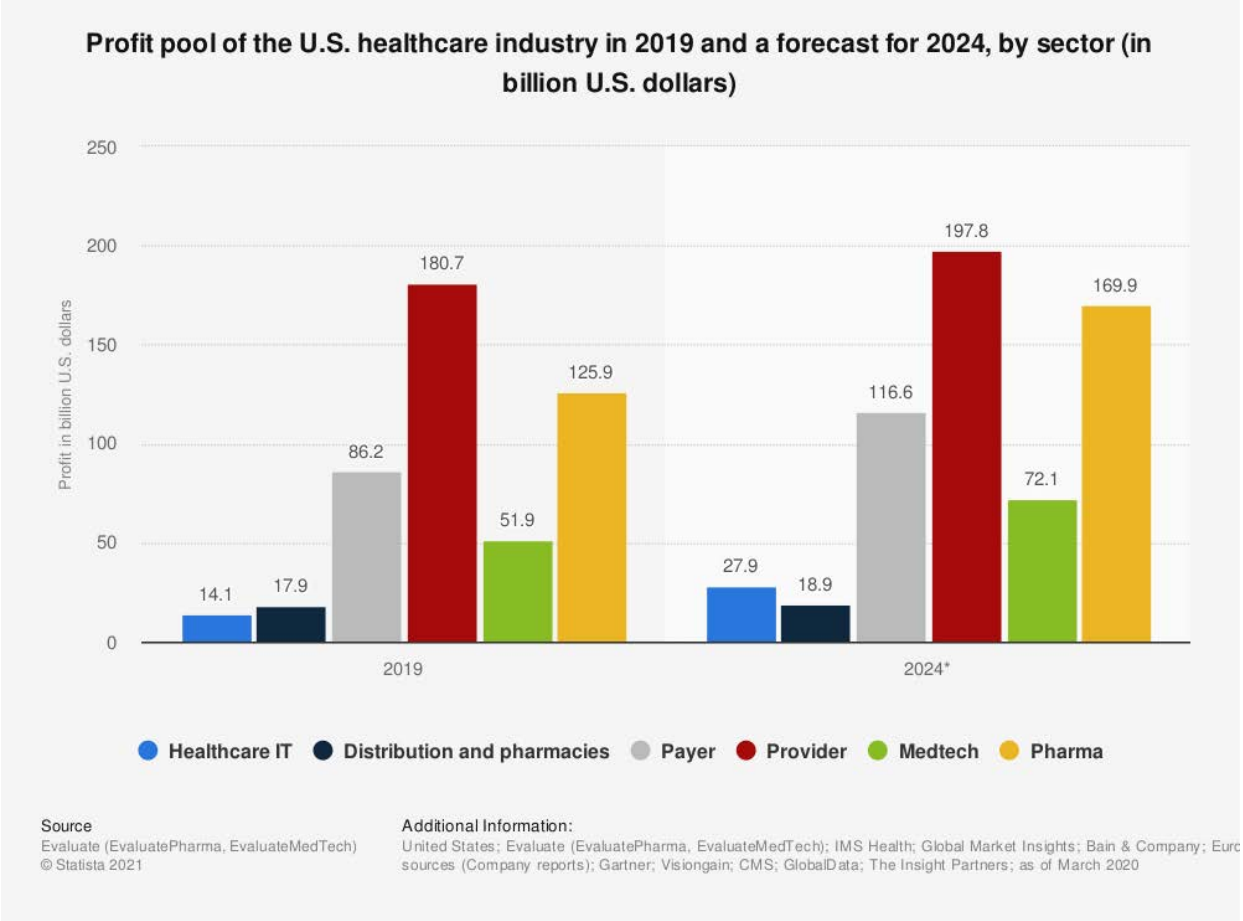
- 29% from the federal government;
- 28% from private households;
- 19% from private businesses;
- 16% from state and local governments;

Traditionally, US healthcare has been a growth industry and this will continue. It is estimated that national US health care spending, $3.81 trillion in 2019, rose to $4.01 trillion in 2020, and will rise to $4.71 trillion in 2023 and $6.19 trillion in 2028. It is further projected that increased prices for medical goods and services would comprise 43% of total projected growth in personal health care spending from 2019-2028. Thus, engaging with the US healthcare sector is a relatively safe bet (given its projected stable growth) and that the fastest growing elements will be medical goods and services.

As noted above, hospital care is the single largest area of US healthcare spending. This hospital spending was projected to increase, by 5.1% annually in 2019 to a total of $1.3 trillion, and by 5.1% again in 2020, but increasing to 5.9% from 2021-23 and then 6% from 2024-2028. This data strongly intimates that US hospitals should be a primary target of Dutch companies wishing to identify and recruit potential US scale purchasers of their goods and services.

On the private sector side, there are an estimated 784,626 health care companies in the US, which employ one in eight Americans. There are an estimated 36,510,207 annual admissions in the US to 6,210 registered hospitals with 931,203 staffed beds.

Private sector profitability in the US healthcare sector remains strong. Total U.S. healthcare industry's profits are projected to rise nearly 5% annually from 2019-2024, with the fastest growth expected in medtech and healthcare IT. Healthcare IT's profits are expected to increase from $14 billion in 2019 to $28 billion in 2024.


Profit pool of the U.S. healthcare industry in 2019 and a forecast for 2024, by sector (in billion U.S. dollars)
Profit in billion U.S. dollars
250
200
150
100
50
0
14.1
17.9
86.2
180.7
51.9
125.9
27.9
18.9
116.6
197.8
72.1
169.9
2019
2024*
Healthcare IT
Distribution and pharmacies
Payer
Provider
Medtech
Pharma
Source
Evaluate (EvaluatePharma, EvaluateMedTech)
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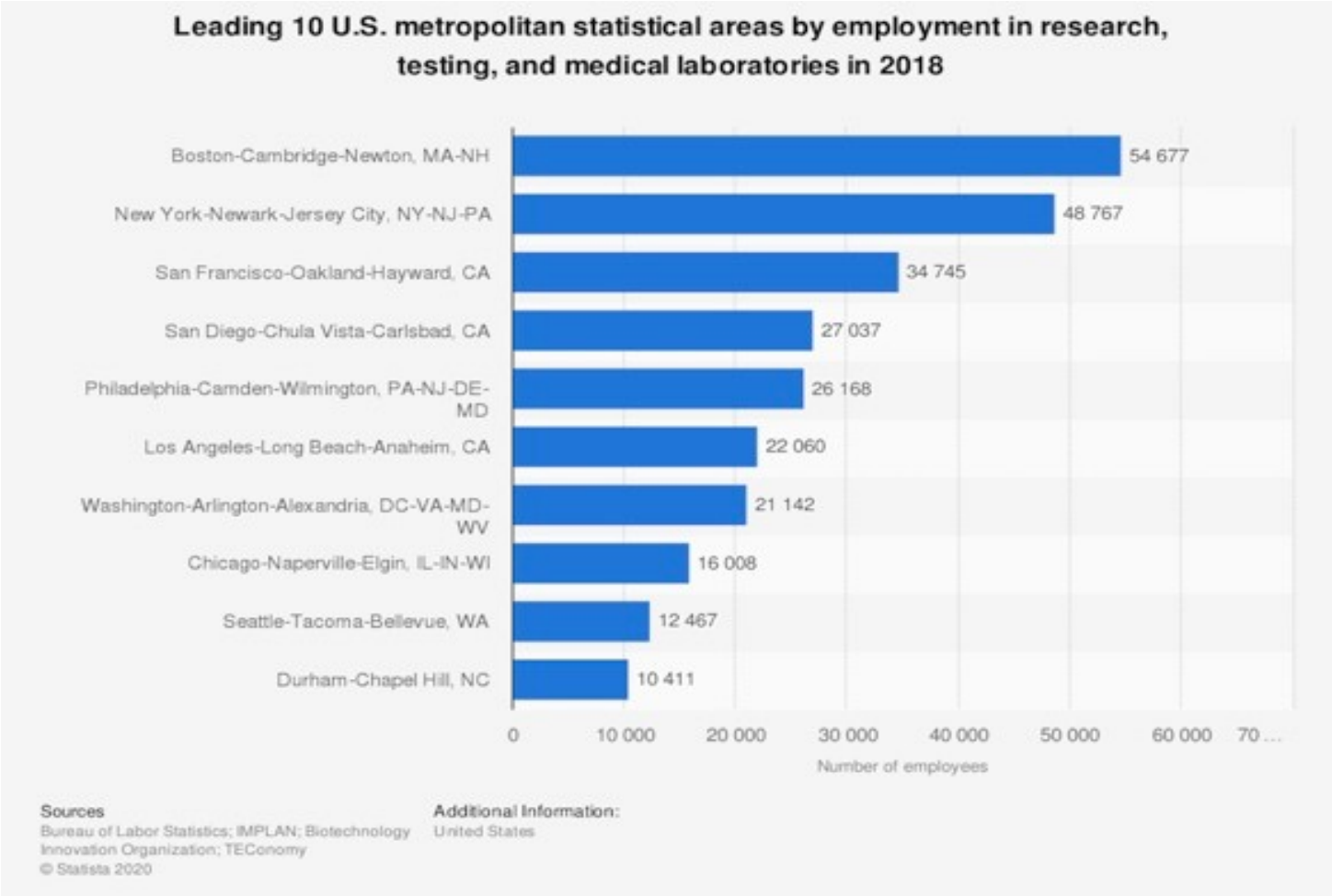
Additional Information:
United States; Evaluate (EvaluatePharma, EvaluateMedTech); IMS Health; Global Market Insights; Bain & Company; Eurc
sources (Company reports); Gartner; Visiongain; CMS; GlobalData; The Insight Partners; as of March 2020

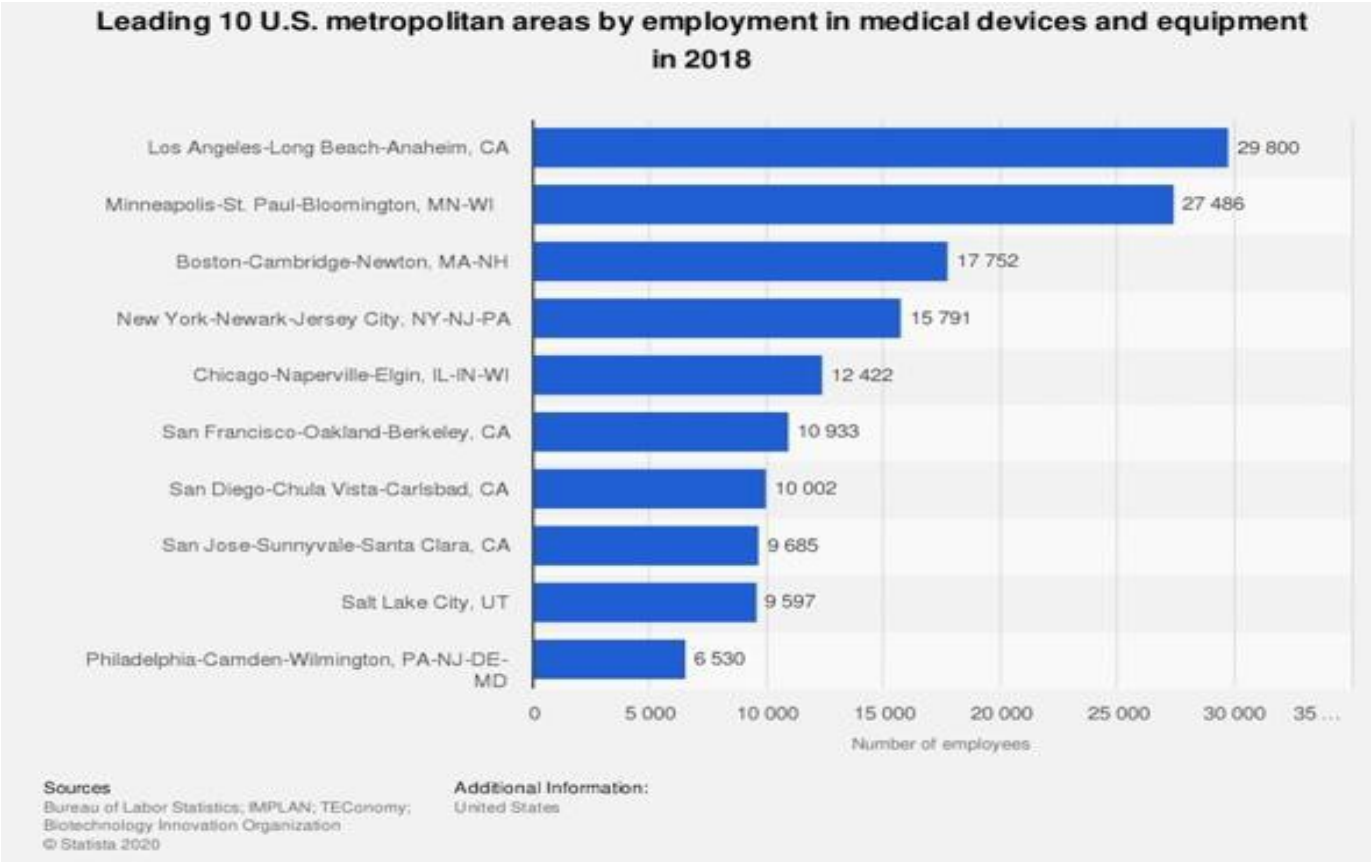
IV. NYC's LSH Sector Vs. Other US LSH Centers

In the US, two key competitors to NYC as LSH metropolitan ecosystems are San Francisco CA and Boston MA. Comparing the three demonstrates NYC's competitiveness, as the sheer scale of NYC's factor endowments confers tremendous benefits. This comparison will also help educate Dutch LSH companies as to which location will suit their needs best, depending on which LSH subsector they inhabit.

One example of NYC's LSH strength is the total number of people employed in medical research, testing, and medical laboratories, as it serves as a key indicator of future LSH innovation potential. In 2018 the NYC/New Jersey-Newark-Jersey City/Pennsylvania area (treated as a single metropolitan area for data collection purposes) employed 48,767 people in this category. This ranked second among all US metro areas behind Boston/Cambridge MA's 54,677 people but was 40.4% higher than third place San Francisco/Oakland/Hayward CA's 34,745.



Regarding medical devices, NYC ranked fourth among all US metro areas in total employment in medical devices and equipment with 15,791, right behind Boston (third at 17,752) but again ahead of San Francisco (sixth, at 10,933).



Source

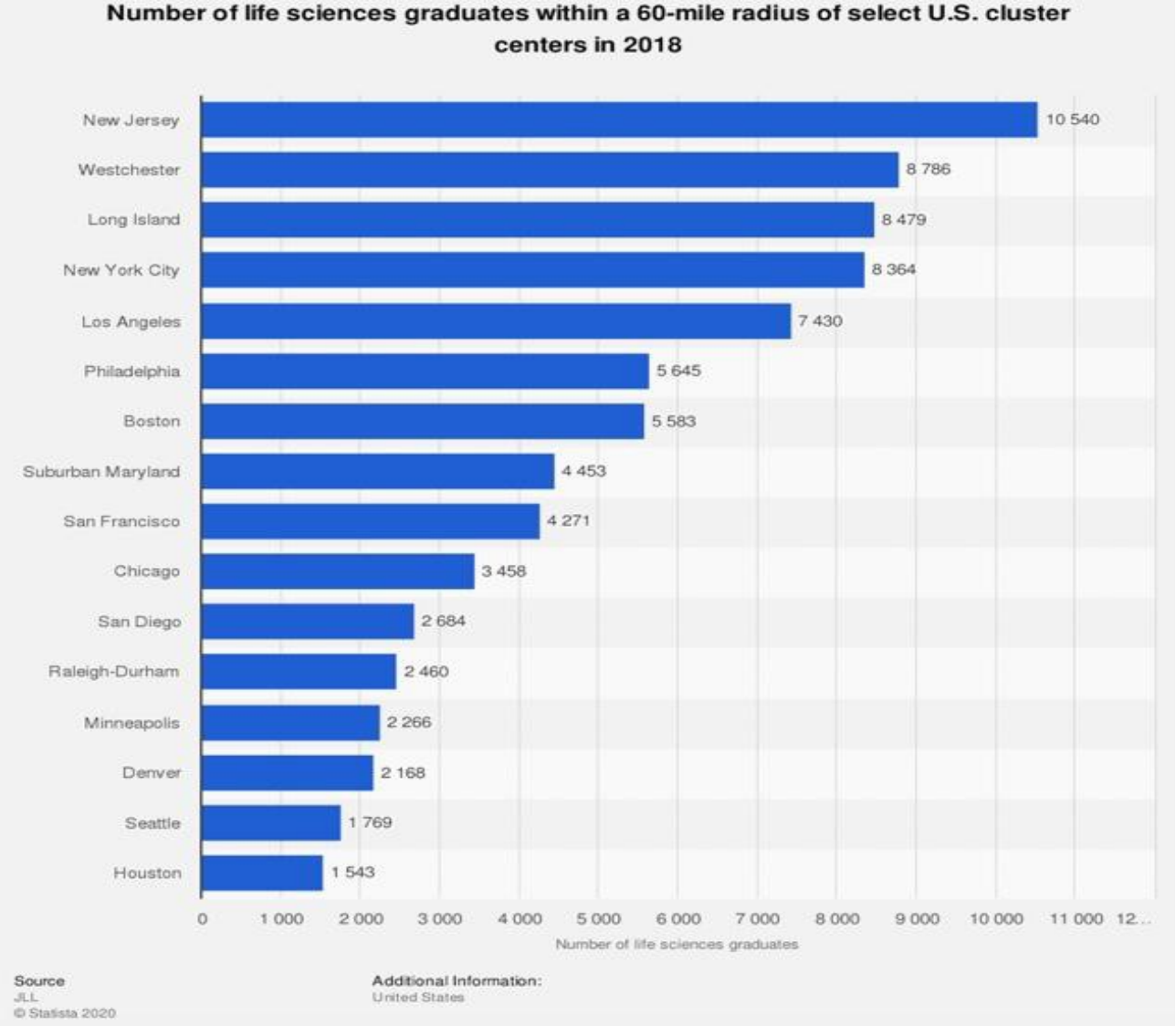
In drug and pharmaceutical employment, in 2018 the NYC metro area employed 32,915 people, the largest number of any US metro area. This was 92.6% higher than San Francisco (ranked third with 17,093) and 242.5% higher than Boston (ranked seventh with 9,611).

For bioscience-related distribution employment, in 2018, the NYC metro area employed 36,518 people, the most in the US. By comparison, Boston ranked ninth with 11,063 and San Francisco ranked nineteenth at 5,731.

NYC also has a strong basis in LSH academic research and human capital development. These elements have long-lasting effects in developing future products, employees, and markets, and building the regional sectoral core.

A relevant indicator is statewide academic bioscience research and development expenditures. In 2018 New York State (with $4.4 billion) ranked second behind top-ranked California ($6.6 billion) and significantly ahead of Massachusetts ($1.8 billion). Furthermore, in 2019 New York ranked third in total National Institutes of Health funding with $2.89 billion, after California ($4.59) and Massachusetts ($3.02 billion).

Another key indicator is the human capital development infrastructure in a region, of how many potential professionals have been trained, who may be willing to remain in the region after university. In 2018 New York City had considerably more life science graduates (8,364) within a 60 mile radius than Boston (5,583) or San Francisco (4,271). This may be a feature of the fact that the top four locations with the most LS graduates within 60 miles were all contiguous to NYC - New Jersey, Westchester, Long Island, and NYC. This strength is a clear demonstration of the power of this regional NYC LSH core and augurs for a vibrant regional future for LS companies and research.


Number of life sciences graduates within a 60-mile radius of select U.S. cluster centers in 2018
New Jersey
Westchester
Long Island
New York City
Los Angeles
Philadelphia
Boston
Suburban Maryland
San Francisco
Chicago
San Diego
Raleigh-Durham
Minneapolis
Denver
Seattle
Houston
10 540
8 786
8 479
8 364
7 430
5 645
5 583
4 453
4 271
3 458
2 684
2 460
2 266
2 168
1 769
1 543
0
1 000
2 000
3 000
4 000
5 000
6 000
7 000
8 000
9 000
10 000
11 000
Number of life sciences graduates
Source
JLL
© Statista 2020
Additional Information:
United States

Source:

V. The Employment and Economic Profile of the NYC LSH Sector

The NYC LSH sector is a massive economic and employment contributor to NYC and its effects are felt broadly across the city, NY State, and the Northeast US.

NYC's hospitals and health systems create an estimated $86.656 billion annually in economic activity, generate 391,000 jobs, pay $28 billion in payrolls, furnish $15.8 billion in taxes, and provide $7.9 billion in community benefits and investments.

The LSH sector is also one of NYC's largest employers. Nationally (as noted above), the 784,626 US health care companies employ one in eight Americans. In 2018 in NY State, there were nearly 1.2 million jobs in health care settings. In 2019 in NYC, health care accounted for 40% of the 87,200 jobs created citywide, with an emphasis on home care services. Also in 2019, New York City added 12,300 social assistance workers, with the largest number of them providing care for the elderly and people with disabilities. In 2016, 12.6% of NYC employment was in the health care sector, compared to 10.6% in the US. Since 2000, jobs in health care settings in New York State have increased by nearly 39%, compared to only 8% for jobs in other employment sectors, demonstrating the relative outsized growth of the LSH sector in NYC. Another example of LSH's importance to NYC is that the Northwell Health System is New York's largest private employer and the largest health care system in the state.

Healthcare is the only NYC employment sector to add jobs every year since 1990; in 2018 it added the most jobs of any sector. The sector added 145,500 jobs between 2009 and 2018 (an increase of 36 percent), accounting for 18 percent of the jobs added during this period. Home health care services was responsible for more than three-quarters of the job gains in the sector during the current expansion (112,900). In 2018, the healthcare sector continued its strong growth, adding 28,900 jobs, more than any other sector and nearly 50% more jobs than business services, bringing sector employment to 550,600. The number of personal care aide jobs statewide increased by nearly 57,000 (40.0%) between 2014 and 2018, the number of home health aide jobs grew by more than 45,000 (30.9%), and the number of registered nurse (RN) jobs increased by nearly 13,000 (7.6%).

This NYC healthcare workforce is predominantly composed of non-US born people. In 2017, foreign-born workers comprised 51% of NYC's Healthcare and Social Assistance workforce.

Finally, NYC's construction industry is demonstrating strong growth in LSH projects and an expanding future for the NYC LSH sector. Between 202-2023, the New York Building Congress estimates that total spending on construction for the NYC healthcare sector to increase by 38%, to exceed $9.4 billion. For the next three years, this spending will increase in four of NYC's five boroughs (excluding Staten Island), and in the Bronx ($660 million) and Brooklyn ($2.3 billion), both are projected to more than double their healthcare construction spending. From 2016 to 2019, NYC spent over $6.8 billion on healthcare construction.

VI. New York City and LSH Venture Capital

As a result of COVID-19, significant global venture capital has moved aggressively into LSH, particularly into digital health and medical devices. NYC has been both heavily involved in and a beneficiary of this trend. By engaging in NYC, Dutch companies could take advantage of this opportunity to work with a rapidly growing investment community focused on innovation.

Global VC Trends in Healthcare Investment:

In Q1 2021, global healthcare investment raised a record-level $31.6 billion in equity funding, which included a record 96 mega-rounds (over $100 million raised). The number of deals increased by 9% to over 1,500 deals, the second-most in the past twelve quarters. Funding in North America grew, including double the number of mega-rounds, while funding in Asia declined. Global digital health funding rose 9% quarter-over-quarter in Q1 2021, with equity funding to digital health companies hitting an all-time high of over $9 billion while the number of deals rose by nearly 13%.

NYC as the Global Financial Capital:

As the global financial capital, NYC enjoys a tremendous advantage in access to institutional and angel capital, even when NYC has not been a traditional location for LSH investment. This access has helped drive numerous NYC LSH startup and scale-up companies, particularly those focused on healthcare-related IT. These two reasons -- access to capital and to highly skilled professionals -- are the same reasons that the NYC tech community has evolved into being the second most vibrant startup ecosystem in the world without being a traditional tech hub. Thus, NYC's evolution into a national/global LSH center may track the similar elevation of the NYC tech sector.

VC Investment in NYC Healthcare Firms

In 2020, VC firms put a record $3.6 billion into NYC-based health-related startups, up 40% over 2019 (and over 400% since 2017) and driven by emerging companies focused on virtual medicine. According to the New York City Health Business Leaders, a trade group focused on healthcare and technology, COVID-19 has accelerated both funding and adoption of technology in this area.

Development of NYC-Based LSH Funds:

Specific developments have advanced overall LSH investment in NYC, such as the increasing emergence of LSH-focused NYC funds. For example, in February 2021 the NYC-based VC firm Adjuvant Capital announced raising $300 million for an investment fund dedicated to improving global public health, backed by the Bill & Melinda Gates Foundation (investing $75 million) and other investors including Merck and Novartis. It is targeting late-stage therapeutics and medical devices that can address public health challenges, including rare diseases and widespread emergencies such as HIV and Covid-19. It commits its recipients to provide access to treatment to underserved populations in low- and middle-income countries.The fund aims to make about 25 investments, each in the range of $10 million to $20 million. Other funds are also springing up in this area.

Key Examples of NYC Digital Health Firms:

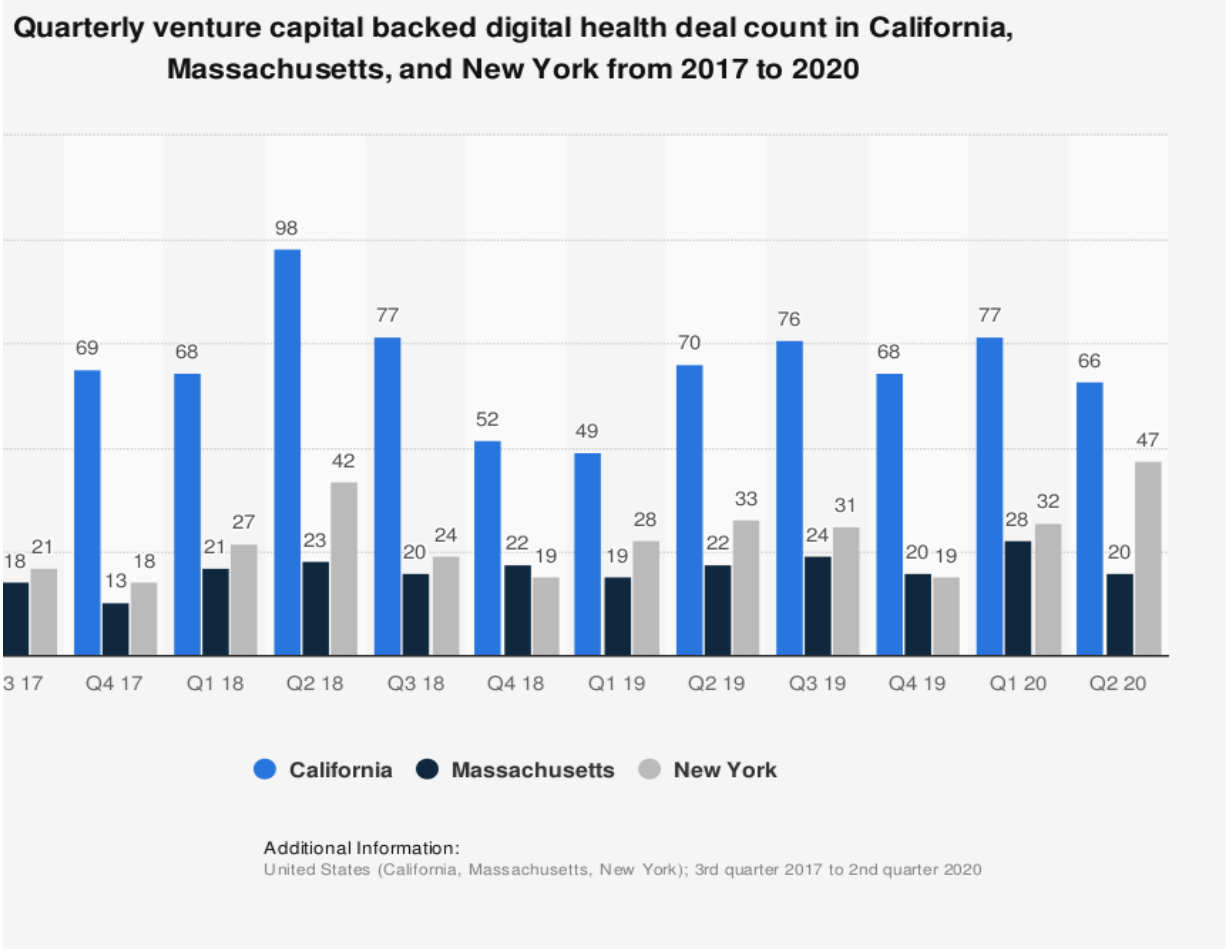
NYC startup firms are also beginning to emerge in the digital medical space, including two unicorns (valued at over $1 billion) Oscar Health and Ro. Oscar offers tech-enabled online health insurance, raised $365 million in 2020, and debuted on the New York Stock Exchange. Ro, an online pharmacy delivery company, was founded in 2017, raised $500 million in 2020 (of a total of $875 million), and is now valued at $5 billion, making it the most valuable private health care startup in NYC. The top biotech company for funding was Neurogene, a Chelsea-based startup that raised $115 million to develop gene therapies for rare neurological diseases.

VC LSH Investment Comparison Between NYC, San Francisco, and Boston:

In terms of VC capital and investment deals, NYC compares well to other key LSH locations, San Francisco and Boston. The chart below shows that from 2017 to 2020, NYC was second only to San Francisco in terms of quarterly VC digital health deals, and was consistently ahead of Boston.

In 2020, NYC was the location of 102 digital health investment deals, second only to San Francisco (with 153) and considerably ahead of Boston (47).

Complementing the number of digital health deals, in 2020 NYC was the second largest funding location in digital health, investing $2.8 billion, after San Francisco ($6.2 billion) and again leading Boston ($1.9 billion).

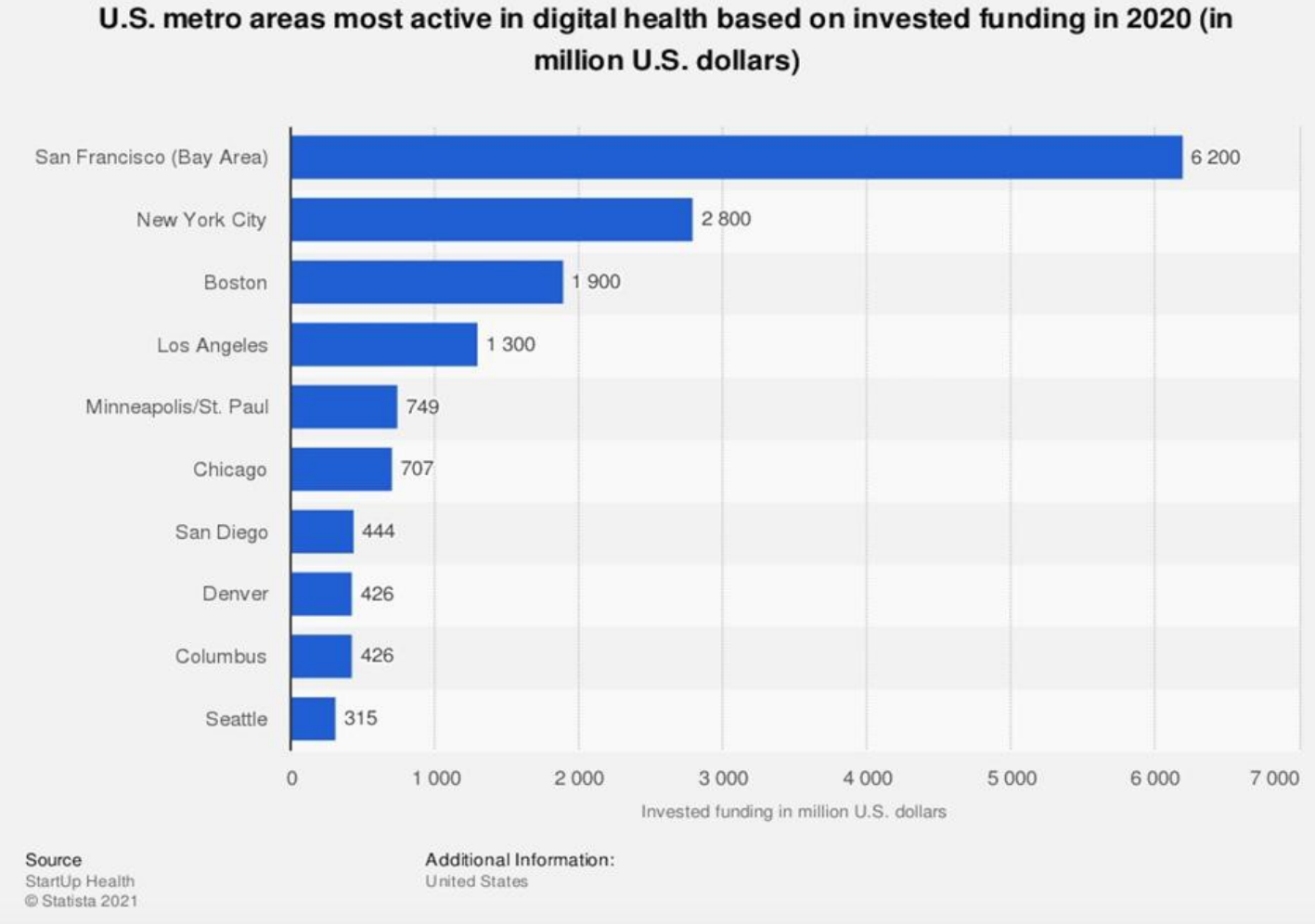


Source:

From the data, NYC has emerged as perhaps the US's second most important center for LSH investment. Its key strengths are its world-leading investment community and its matchless ability to attract and retain highly skilled human capital. Numerous new LSH-focused funds are being created in NYC, as are NYC-based LSH startups, with increasing emphasis on digital health, connected to a large LSH medical infrastructure for testing and market opportunities.

In short, Dutch firms should be able to attract investment capital in NYC for their LSH offerings, if they are competitive and have a defined and attractive market application. Furthemore, physically locating in NYC reportedly improves the odds of obtaining financing, as investment decisions are beginning to return to in-person meetings and

VCs and other investors strongly prefer having their portfolio companies being located/headquartered near to them (so that they can easily monitor their progress).



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VII. The New York City Life Sciences Health Care Infrastructure

The NYC LSH is an interesting mix of quality with quantity. Its innovative and advanced elements are reinforced by an economy of scale unmatched by any other US metropolitan area. Thus, it is important to recognize the market-defining (i.e. new) opportunities offered as well as (and as different from) the market-complying (i.e. existing) opportunities in America's largest mature healthcare market.

New York City has often led the United States on issues of public health; in 1736, NYC undertook the very first public health undertaking in the US, when municipal leaders established a six-bed infirmary on a site now occupied by NYC City Hall.

NYC's health care infrastructure, traditional and digital, is impressive. NYC has nine academic medical centers, over 50 hospitals, and over 100 disease specialty research foundations. New York institutions receive some $2 billion in National Institute of Health R&D grant funding and have helped startups raise over $1 billion in venture capital. It is the second largest center for digital health innovation in the US after Silicon Valley.

The city-run NYC Health and Hospitals health care system is the largest municipal healthcare organization in the US. It is a $6.7 billion integrated healthcare delivery system and one of NYCs largest providers of government-sponsored health insurance for nearly 500,000 New Yorkers. It serves 1.4 million New Yorkers every year, of which over 475,000 have no health insurance. The system provides medical, mental health and substance abuse services through its 11 acute care hospitals, five skilled nursing facilities, six large diagnostic and treatment centers and over 70 community based clinics.

Despite the strength of this infrastructure, not all New Yorkers enjoy health insurance coverage. In 2019, 6.2% of New Yorkers were uninsured; 3.9% of Whites, 6.5% of Blacks, 11.3% of Hispanics, and 12.9% of American Indians.

NYC's Larger Hospitals:

NYC is home to an extraordinary network of hospitals and medical centers. They comprise one of the most important elements of the NYC LSH sector. Both their ability to provide care to millions of New Yorkers as well as their capacity to generate research and development of innovative new technologies and procedures is a central attraction of NYC to patients, researchers, health nonprofits, venture capitalists, and policy analysts. Below is a brief list of a few of the larger institutions.

Northwell Health System:

As previously noted, Northwell Health System is New York's largest private employer and the largest health care system in the state and in the Northeastern United States. In 1997, Northwell Health's status grew exponentially when North Shore Health System and Long Island Jewish Medical Center merged together. Eighteen years later they renamed themselves Northwell Health and continued to integrate their capacity to expand inpatient and outpatient care within the NY metropolitan area. Since opening the first genetic lab in Long Island in 1963, Northwell Health has extended itself to the research branch of healthcare through their Feinstein Institute for Medical Research. Headquartered in Manhasset, N.Y., the institute has over 1,500 clinicians, scientists and staff as well as over 15,000 patients participating in over 2,000 research studies. Overall, the institute has managed to produce over 200 patents and create a dozen biotech firms. Northwell supports emerging medical technology through their venture branch while also supporting health education through their partnered medical school. With 23 hospitals, 830 outpatient facilities, 76,000 employees and over 300,000 inpatient individuals being cared for in NYC each year, Northwell Health has become the largest healthcare system serving the city today.

NYC Health + Hospitals

In 1969, NY created the Health and Hospitals Corporation to replace NYC's Department of Hospitals. From this, NYC Health + Hospitals became a public health system with the responsibilities of managing and operating all NYC public hospitals and clinics as a public benefit corporation. For example, the public hospitals under the NYC Health and Hospitals banner offer top-ranked trauma care, mental health services and other inpatient specialites. In addition to this, NYC Health + Hospitals have received special designation for high quality LGBTQ healthcare. Today, NYC Health + Hospitals is the largest public healthcare system in the nation, operating 11 acute care and 5 post-acute care hospitals while also employing 45,031 workers and serving over 1M New York patients through inpatient, outpatient and home-based services every year.

NewYork- Presbyterian Hospital

In 1998, New York Hospital and The Presbyterian Hospital merged and unified as New York Presbyterian Hospital. Since that time, it has become one of the most comprehensive and world-class academic medical centers in the United States, serving two million patients per year. Today they are a leading provider of inpatient, ambulatory,

and preventive care in all areas of medicine. NY-Presbyterian Hospital has been ranked #1 in the NY metro area by *U.S. News and World Report* as well as named to the Honor Roll of America's Best Hospitals. Today, NY-Presbyterian Hospital manages 10 hospitals and over 125 primary/multispecialty practices while also employing 47,000 workers and conducting more than 2,200 open heart surgeries and 15,000 infant deliveries per year.

Mount Sinai Health System

Founded in 1852, Mount Sinai Health System emerged as a prominent medical system in the NYC region. According to the *U.S. News & World Report*, Mt. Sinai was given high recognition for their services in six of the following specialties; Geriatrics, Cardiology, Gastroenterology, Endocrinology, Nephrology, and Neurology. Mount Sinai is the only medical center within NY to be granted a Disease-Specific Care Comprehensive Stroke Center Certification deriving from The Joint Commission. With the health system operating 8 hospitals and 35 outpatient facilities, while also employing over 43,000 employees and serving 154,662 inpatient services, Mount Sinai has become an influential force in NYC, advancing healthcare quality and outcomes.

NYU Langone Health

Founded in 1841, NYU Langone Health has become one of America's best academic medical centers. In 2021, NYU Langone manages 6 inpatient health facilities and employs over 14,000 workers. Their ability to offer high quality patient care is prevalent in the fact that NYU Langone's Tisch Hospital, Kimmel Pavilion, NYU Langone Hospital-Long Island and NYU Langone Hospital-Brooklyn all recieved an "A" in Leapfrog Hospital Safety; a national distinction recognizing achievement in providing the highest level of patient care across the health system. They also offer a robust rehabilitation program, having been recognized as being one of the top ten best US rehabilitation programs since 1989 by the *U.S. News & World Report.* In addition to its direct healthcare services, NYU Langone also participates in various philanthropic activities, including donating $1 billion in 2019 to underserved communities with the goal of bettering healthcare equity and healthcare outcomes.

Bronx Care Health

The Bronx Care Health is the largest voluntary, not-for-profit health and teaching hospital system in NYC offering services to the South and Central Bronx. Their two main hospitals hold 859 beds, employ 4,500 workers and complete close to one million outpatient appointments each year. Their emergency rooms respond to 141,000 visits

per year. Bronxcare has also contributed $300 million into the local economy. More specifically, they invested in developing a 60,000 square foot health and wellness facility for outpatient care as well as a 56,000 square foot recovery center for individuals struggling with chemical dependency.

Memorial Sloan Kettering Cancer Center

Founded in 1884, Memorial Sloan Kettering became the first healthcare institution in the United States to devote all of its services towards oncology. It is currently one of the largest private cancer centers in the world, employing over 1,000 physicians, caring for 23,500 patients per year, and generating over $5.4 billion in operating revenue. Beyond patient care, Memorial Sloan Kettering operates over 120 research laboratories as their primary resources are allocated towards oncology research. Today, their doctors are leading more than 900 clinical trial investigations and from 1980-2015, Sloan Kettering has received approval for ten drugs developed within their labs.

Primary Care, Secondary Care, Tertiary Care Providers

Within NYC's hospitals and medical facilities, the constellation of different forms of care and providers are legion. According to New York State's Department of Health, there are over 1,300 healthcare facilities providing services in NYC. However, many are specialized centers and only some 450 offer primary care (52% being located in Manhattan and Brooklyn).

Primary care is the most important element in the provision of healthcare in NYC. New York State has the second most active primary care doctors of any state, after California. Within the five boroughs of NYC, there are 56 hospital facilities currently licensed to offer primary medical services (with 197 in all of New York State). Within New York State (not simply NYC), there are 41,076 active primary care doctors. There is considerable variance in primary care availability within the different boroughs of NYC, where Manhattan (at 21.2 primary care providers per 10,000 people) reportedly had over double the number of primary care physicians in the Bronx (8.9), Queens, Staten Island, and Brooklyn. Within NYC, primary care doctors earn annually between $184,000-$241,000. However, male primary care practitioners reportedly earned an average of 34% more than female practitioners, $255,000 to $191,000.

NYC's government provides specific assistance to NYC primary care facilities to fulfill several goals. These include improving prevention and primary care, facilitating connections between communities and clinical resources, educating on the adoption

and use of information systems, adapting data and health information to facilitate improvements in patient care and healthcare and translating federal, state, and local policies and programs into actions (i.e. Meaningful Use, Patient-Centered Medical Home, Advanced Primary Care). Supplementing this assistance may be another opportunity for Dutch firms, particularly if it can be substantiated by a past record of accomplishments with hospitals in the Netherlands.

The need for primary care services was exacerbated by COVID-19 and will likely grow, following the end of the pandemic. Access to primary care varies by location within NYC, and neighborhoods of low-income residents and people of color have sometimes had fewer primary care locations, leading to higher rates of COVID-19. Beyond COVID, issues of acute and chronic disease will remain pressing and a major focus on primary care facilities and professionals. Locations with fewer primary care providers per person have correlated to increased rates of obesity and premature mortality, suggesting that "populations with lower availability of primary care providers experience disproportionate rates of morbidity and mortality." This held true in some of the rural areas of New York State, where there were fewer primary care providers.

This relative lack of primary care providers was reflected in NYC pre-COVID, specifically in the Bronx, where the Bronx registered 41.9 preventable emergency room visits per 100 emergency department visits. The Bronx also reported 27.5% of adults reporting fair or poor health, the highest percentage of any county in New York State, followed closely with the third highest percentage by Queens at 17.3%.

Regarding secondary care (increased specialization beyond primary care) within the five boroughs of NYC, there are 61 hospital facilities currently licensed to offer secondary or other medical services (205 in all of New York State). There are 53,023 specialist physicians within New York State. Within NYC, these specialist physicians earned an estimated average of $298,000 annually. However, male specialist physicians reportedly earned 33% more than their female colleagues, $357,000 to $269,000.

Tertiary care offers an increased level of specialization beyond secondary care. The demand for specialization in NYC is considerable, which can generate attendantly higher revenues. In 2017 in NYC, there were:

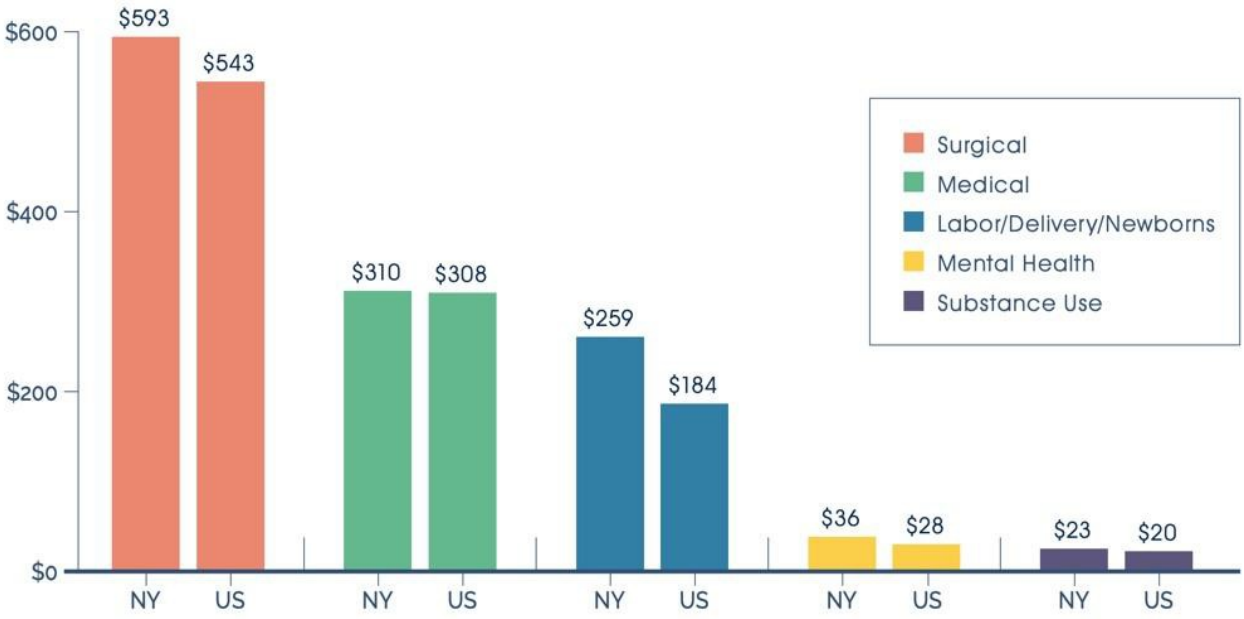
- 37,513 cesarean births at 40 facilities (median cost $10,046);
- 11,331 stent heart surgeries performed by 31 facilities (median cost $16,994);
- 12,768 hip replacement surgeries in 48 facilities (median cost $22,754);
- 14,659 knee replacement surgeries (median cost $22,675) by 45 facilities;

- 7,466 bariatric/obesity surgeries in 32 facilities (median cost $11,102);
- 4,768 spinal fusion surgeries at 41 facilities (median cost $41,498);

In 2020, there were 4,335 specialized surgeons in New York State. These specialized surgeons in NYC earned an average of $430,000 and practiced in NYC at 57 facilities in NYC offering ambulatory surgery, 16 facilities offering adult cardiac surgery, 5 facilities offering pediatric cardiac surgery, 4 offering adult heart transplants, 7 offering kidney transplants, and 6 offering liver transplants.

As a result of COVID-19, all elective surgical procedures were canceled from December 4, 2020 until January 26, 2021, when they were allowed to recommence. The pent-up demand for such surgeries is now manifesting, reinflating the market for such medical services. In general, New York State is considered an expensive medical market, where inpatient surgical prices are generally higher than elsewhere in the US.

FIGURE 10: Distribution of Inpatient Spending Per Person by Type of Admission in New York and Nationally: 2017



Other specialties include rehabilitation care, where across New York State there are 109 facilities for primary stroke recovery, 13 facilities for comprehensive stroke recovery, and 10 facilities for burn recovery.

There is also a considerable elderly care provider subsector, as there are 1.1 million older New Yorkers living in NYC (over 65), comprising 13% of NYC's total population.

Across NY State, elder care is a strong sector, with over 440 independent living facilities, over 610 assisted living facilities, over 400 memory care facilities, over 1,400 nursing homes, and over 200 adult day care facilities.

VIII. New York City's LSH Innovation and Research Institutions

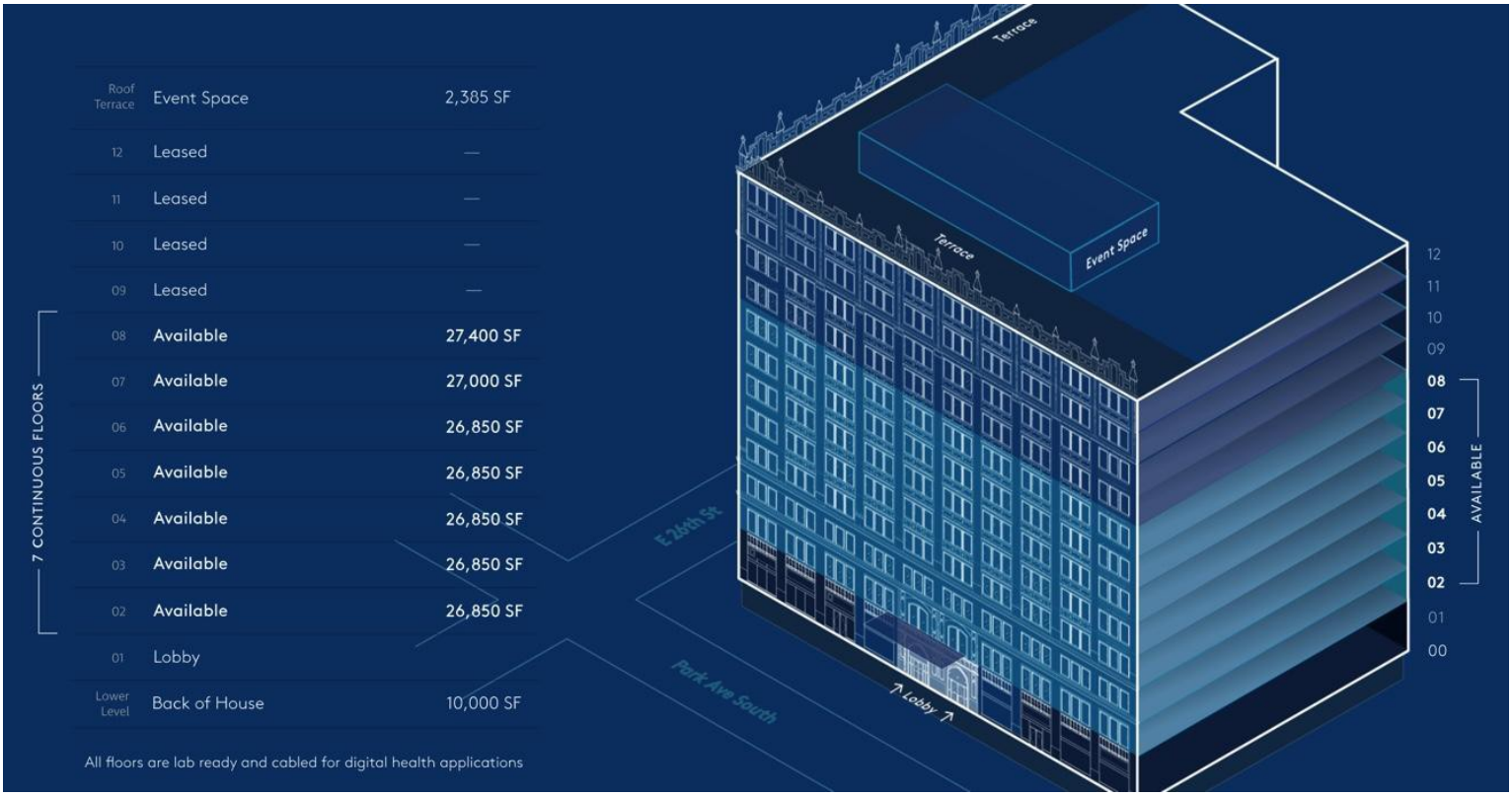
NYC possesses an extraordinary constellation of research and innovation institutions participating in and furthering the advance of NYC's LSH sector. It is this combination of public, private, and nonprofit sectors that has materially assisted NYC's rise as an LSH center. It is certainly an attractive one for Dutch companies to join.

The NYC government is making proactive efforts to build the city into a global LSH location. This effort includes NYCEDC's LifeSci NYC initiative, a $500 million commitment to establishing New York City as a global leader in life sciences R&D and innovation. The $500M will be allocated into three categories;

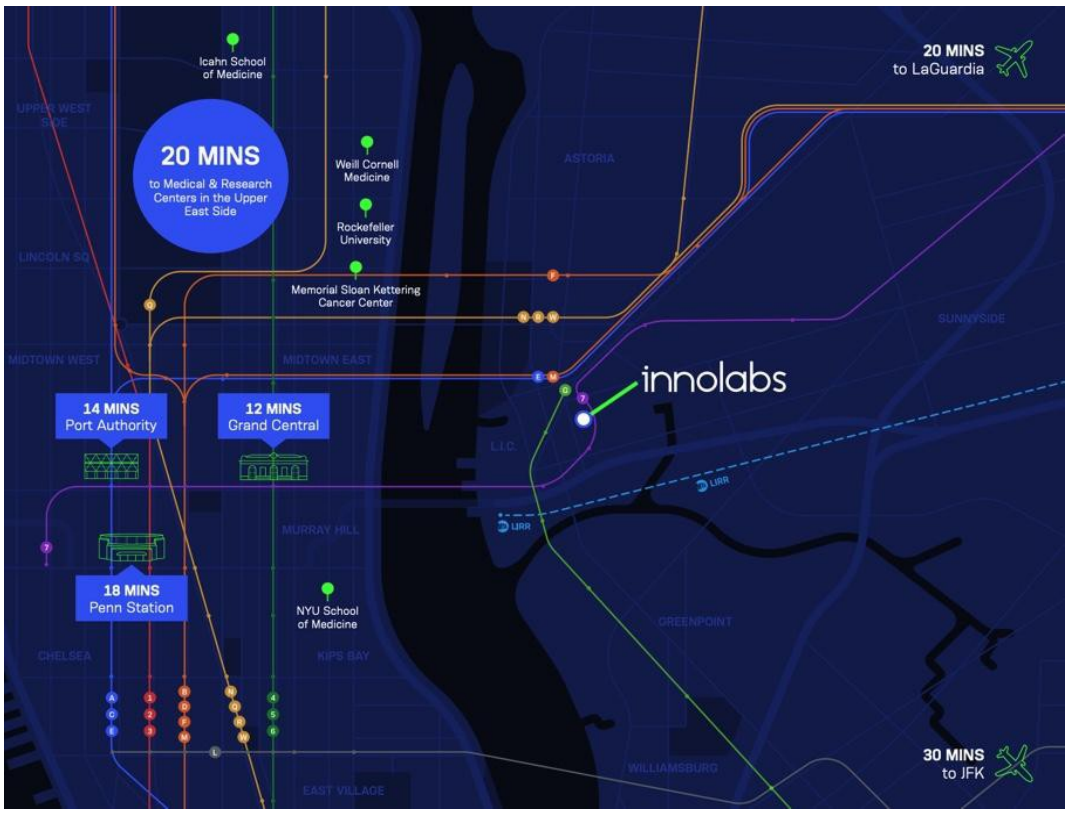
- $150M for infrastructure to connect research to industry;
- $300M for additional work space;
- $50M to "build a pipeline for diverse life sciences talent and support early-stage life sciences companies."

LifeSci NYC is intended to create an estimated 16,000 jobs, develop up to three million square feet of new space for life sciences companies and researchers, and build a pipeline for the human talent and workforce needed to support these companies in NYC. This includes multiple real estate developments to provide LSH innovation infrastructure, such as:

- 345 Park Avenue South, where NYC is working with Deerfield Management to convert a 12-story building into a life sciences campus housing some 1,400 jobs in 300,000 square feet of space (two-thirds of which would be wet lab capable) to promote cutting edge R&D, hosting space for labs, lecture halls and academic offices. NYCEDC committed $92 million over 20 years in economic incentives toward the project, while Deerfield has committed $30 million toward developing programs with the economic development agency that will be designed to prepare New Yorkers for life-sci careers.

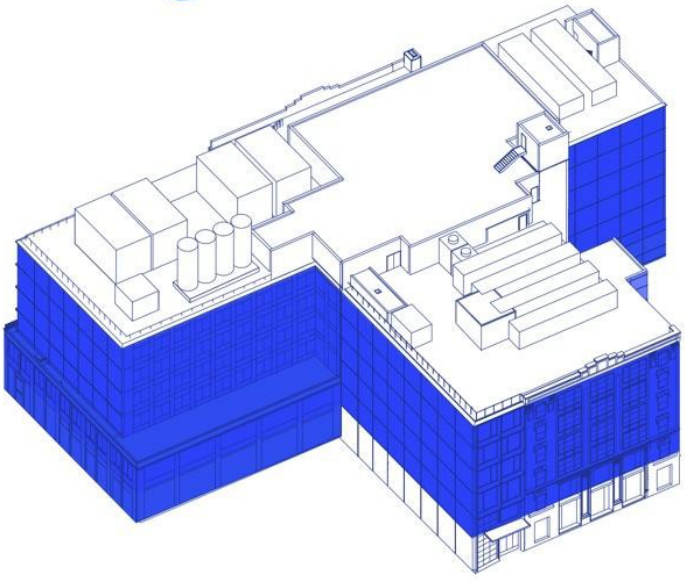


- NYC is also launching Innolabs in Long Island City, Queens, offering 267,000 square feet of commercial life science space and lab facility. NYC's LifeSci program supported this project, with GFP Realestate and King Street Properties partnering in this endeavor.



availability

Floor	Area
6th Floor	46,179 RSF
5th Floor	46,179 RSF
4th Floor	46,179 RSF
3rd Floor	46,179 RSF
2nd Floor	47,791 RSF
Ground Floor	30,380 RSF
Basement	3,904 RSF
Total	**266,791 RSF**



- NYC is allocating $38 million in grants to four biotech institutions within the city intended to promote relationships between the academic community of science, the biotech sector, and the pharmaceutical sector in the hopes of creating new healthcare treatments/solutions while also expanding the local industry (these are detailed below):
- NYC is giving a $5 million grant (with $2 million more coming from New York State government) to NYU Langone Health, which has opened a 50,000-square-foot biotech incubator space in Manhattan with corporate sponsors including biopharma giants Bristol-Myers Squibb, Sanofi and Boehringer Ingelheim.
- Mayor De Blasio announced the creation of (and issued the RFPs for) the first NYC Pandemic Response Institute, intended to make NYC the public health capital of the world. It begins operations in 2021, it has a commitment of $20 million of NYC government funds, to be coupled with private partners, to convene and coordinate NYC agencies, communities, industry, and academia to prevent, prepare for, respond to, and recover from future public health emergencies.

There are a series of NYC incubators and accelerators for early- and late-stage LSH companies to develop and thrive. Some may be applied to from the Netherlands, some require a NYC presence to apply.

Please see Appendix I to review a list of Pre-Arrival NYC LSH resources for Dutch companies and Appendix II to review a list of Post-Arrival NYC LSH resources.

In addition to the resources listed in the appendix, there are other accelerators, resources, and labs:

- The NYC Life Sciences Fund

This $120M - $150M fund provided by the partnership of the NYC Economic Development Corporation and other VCs grant funding to early-stage life science companies with the intention to launch breakthrough life science ventures.

- SBIR Impact NYC

SBIR Impact NYC offers personal coaching, advice and workshops to assist NYC life sciences and healthcare companies to better compete for federal Small Business

Innovation Research grants (SBIR) and Small Business and Technology Transfer (STTR) grants. Specifically, they offer introductory workshops and webinars open to prospective applicants, specialized assistance through a combination of topical webinars, and up to 20 hours of one-on-one expert proposal development assistance for each of 20 select companies actively preparing SBIR/STTR proposals.

- Alexandria Center for Life Sciences

This space has over one million square feet of commercial laboratory space for early stage life sciences companies and is home to a diverse range of high-quality life science entities, including multinational pharmaceutical companies and a number of growth- and early-stage companies. It fosters innovative collaborations among New York's renowned academic and medical institutions, preeminent scientific talent, top-tier investment capital, and a broad and diverse commercial life science industry.

- Alexandria Real Estate Equities, Inc.

Acting as an extension of the Alexandria Center for Life Science, Alexandria LaunchLabs provides 15,000 square feet of startup office and lab space as well as access to startup capital through the Alexandria Seed Capital Platform.

- BioBat at Brooklyn Army Terminal

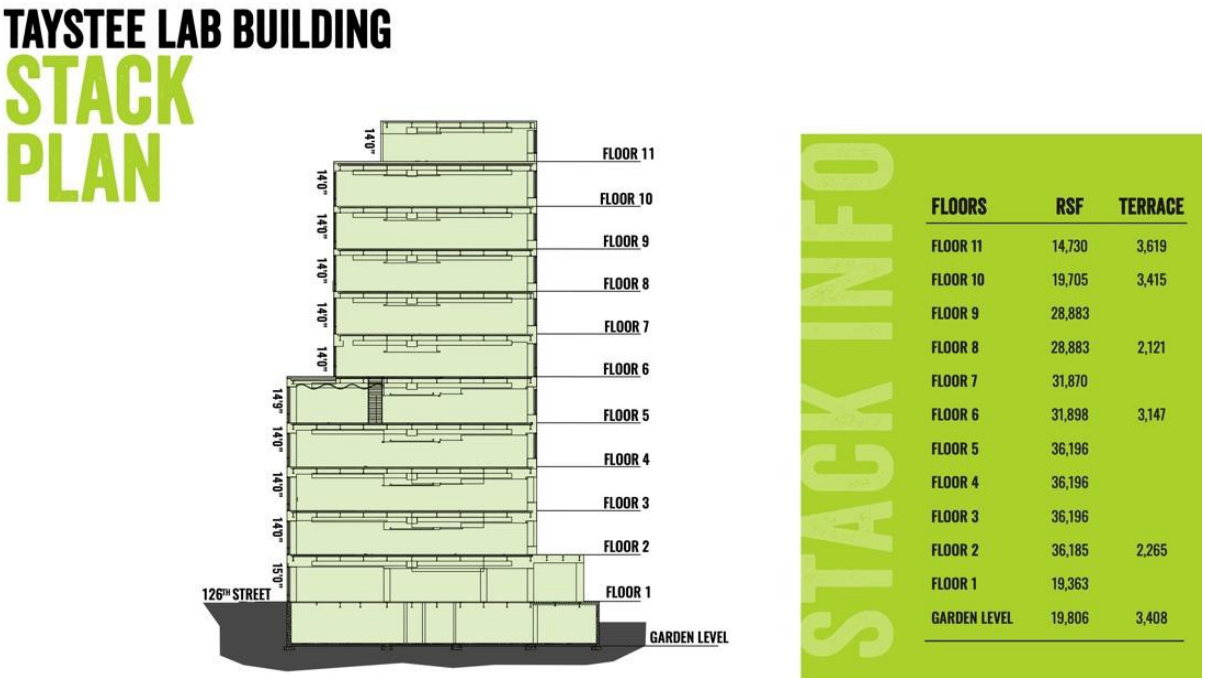
A partnership created by the Research Foundation for SUNY, on behalf of Downstate Health Sciences University and the NYCEDC, BioBat is a 50,000 square foot biotech co-working facility providing flexible wet-lab bench rental, collaborative space, research equipment, business support and acceleration programming for early-stage life sciences companies.

- 125 West End Avenue:

Real estate developers, Taconic Partners and Nuveen Real Estate, are planning to begin the conversion of a former auto showroom building in the Upper West Side into a research and laboratory complex in 2021. Costing $230M, the building will be an eight story, 400,000-square-foot building offering research and laboratory space. Recently, the real estate developers announced that they have obtained $600 million in capitalization for this location.

- Taystee Lab Building

Janus Property has almost completed their eleven-story, 350,000-square-foot Taystee Lab Building that will provide support to life science companies and operations through lab space.



NYC University Research Centers

NYC is also the home to a series of prestigious and well-resourced universities, research centers, and knowledge institutes. The LifeSci NYC Initiative to boost life science development within NYC has announced $38 million in infrastructure grants to the following four leading scientific research institutions; Columbia University, Montefiore-Einstein, the New York Stem Cell Foundation and Rockefeller University.

- Columbia University

Columbia University will receive up to $9 million from NYC for the Columbia University's Therapeutic Validation Center, to establish research facilities aimed at turning early-stage research into new start-ups. The Center will use mass spectrometry imaging technology to create next-generation medicines that work by analyzing and orchestrating the behavior of individual cells in the human body to work in concert to eliminate disease. It will be housed within existing facilities at Columbia and will be open to scientists and entrepreneurs from across the city.

- Einstein-Montefiore

Montefiore Medicine will receive up to $13 million from the LifeSci Initiative grant to launch the Einstein-Montefiore Biotechnology Accelerated Research Center (EMBARC) to establish a manufacturing operation focused on cell, gene, and antibody therapy production. This facility will be located on Montefiore's Einstein campus in Morris Park and be open to early stage and established companies in need of these scientific facilities.

- New York Stem Cell Foundation

The New York Stem Cell Foundation is an independent laboratory and non-profit accelerator committed to developing cures for diseases through stem cell research. It will receive up to $6.5 million through the LifeSci initiative to equip an expansion of its Research Institute located in West Midtown, enabling the translation of their research into new drugs and treatments ready for the clinic. The Institute's expanded operations also allow further collaborations with local universities, biotechnology companies, pharmaceutical companies, and technology organizations who look to bring innovative cell-based treatments to patients in need. The equipment, funded by the City, will increase NYSCF's cell production capacity, process development abilities, and drug screening capabilities. The grant will also fund equipment for the NYSCF Research Institute clinical laboratory to further enable precision medicine approaches.

- Rockefeller University

Rockefeller University is a private graduate university in NYC that will receive up to $9 million to convert academic research labs into an incubator for commercial life sciences, which will serve as the first of its kind in the Upper East Side cluster of biomedical institutions. This new facility will also seek to convert the scientific potential of Memorial Sloan Kettering Cancer Center and Weill Cornell Medicine into local high-growth companies.

- Weill Cornell Medicine, Cornell University

As the biomedical research unit and medical school of Cornell University, Weill Cornell Medicine is one of the largest academic medical centers in the United States. More specifically, Weill Cornell sees 3 million patients annually and has received 890 National Institute of Health (NIH) awards. In terms of clinical research, Weill Cornell's Clinical & Translational Science Center Department provides leadership that ".increasingly supported efforts to train community-based investigators and expand their ability to conduct collaborative research with faculty members; to educate the community on the

importance of participation in clinical research; and to pilot projects that advance transdisciplinary team research innovation and entrepreneurship."

- New York University

NYU Langone offers a 50,000 square foot biotech co-working facility providing flexible wet-lab bench rental, collaborative space, research equipment, business support and acceleration programming for early-stage life sciences companies, located in Hudson Square in Lower Manhattan. NYU Langone invested $8 million to renovate BioLabs and received a $5 million grant from NYC and $2 million from the NYS governments. It will house over 35 companies and 160 scientists, business, and support staff. Among the nearly two dozen early-stage companies currently housed at BioLabs@NYULangone are precision oncology medicine company Black Diamond Therapeutics and pharmaceutical company Sparian Biosciences, which is developing novel, safe analgesics. Another participant is microbiome biotechnology startup Fitbiomics, where researchers are studying gut bacteria from elite athletes to unlock the key to athletic performance.

IX. COVID-19 and Public Health/Strengthening NYC's Health Care System

COVID-19 has become the overwhelming and near-defining element of the NYC LSH system; the pandemic and public health have become synonymous. Few tactical or strategic decisions will be made without direct consideration of its effects, the near-term consequences, and its potential to return in a different form.

COVID-19 has opened a process of reconsideration of the entire NYC healthcare infrastructure. NYC and NYS are now acutely aware of the many limitations of their processes and preparations, as all of them have been tested (and their shortcomings revealed) by the pandemic. This reassessment offers Dutch companies a precious opportunity to enter the NYC market and contribute to NYC's rebuilding and reinforcing its public health system, as well as lucrative market opportunities with NYC's private sector health actors. Either by offering innovative new products and services, or by assisting NYC institutions to update its older tech to current demands, NYC offers Dutch companies a target-rich, tech-interested environment for its wares.

NYC's COVID-19 Spending by NYC and NYS:

NYC's government's January 2021 Financial Plan included $3.58 billion in COVID-related spending in FY 2021. Through April 14 th, 2020, NYC committed to $3.75 billion in COVID-related spending in FY 2021, exceeding the budget amount previously detailed. In total, the City has incurred or committed to $6.37 billion in COVID related spending in FY 2020 and FY 2021. In other words, NYC's government is now committed to responding to the pandemic in an organic fashion, and it has already demonstrated its willingness to spend beyond its prescribed budgetary limits in order to revamp the system, with the goals of helping all New Yorkers get vaccinated, assist the city to recover from the pandemic, and to prepare the municipal system for another potential future crisis.

NYC FY 2021 NYC COVID-19 Expenditures

	Budget	Committed	Expensed
Medical, Surgical and Lab Supplies	$788 M	$614 M	$381 M
NYC Health+Hospitals	813 M	750 M	750 M
Dept. of Emergency Management	264 M	228 M	138 M
Uniformed Agencies Overtime	24 M	1 M	1 M
Dept. of Design and Construction	89 M	34 M	10 M
Dept. of Small Business Services	81 M	33 M	31 M
Dept. of Education	78 M	208 M	150 M
Dept. of Homeless Services	329 M	319 M	231 M
Food/Forage	527 M	386 M	373 M
Other	591 M	430 M	265 M
Total	**$3.584 B**	**$3.003 B**	**$2.330 B**

SOURCE: Office of the NYC Comptroller from FMS.

COVID-19 Contracts

NYC has recently concluded several large-scale contracts, which demonstrated the seriousness with which the city is addressing the pandemic and the weaknesses of its current infrastructure. Through January 27th, 2021, NYC had registered $4.69 billion in contracts to procure goods and services in response to the COVID pandemic. Nearly 60% of the contracts, or $2.81 billion, were for hotel and food related contracts and the procurement of personal protective equipment (PPE). Other significant contracts included $505 million for medical staffing for COVID-19, $149 million for ventilators and $100 million for testing centers.

Other NYC taxpayer monies were disbursed in COVID-19-related contracts for:

- Ventilators, portable x-rays, oxidizers: $552 million
- Personal Protective Equipment: $552 million
- Metropolitan Transportation Authority (public transit cleaning and personnel costs): $245 million

- Personnel Costs: $286 million
- Testing: $117 million

The pandemic revealed to senior government officials how vulnerable NYC and NYS were to distribution disruptions in deliveries of medical supplies. Reliance on foreign sources of materials, particularly of PPE, ventilators, medical gloves and gowns, translated into months of waiting, concluding risky procurement contracts with unproven vendors, and depending on the arrival of foreign shipments through politically-controlled customs bureaus. This motivated the governments of NYC and NYS to promote domestic (i.e. either within the US, within NYS, or within NYC) production of several critical pandemic medical supplies, building the manufacturing and market infrastructure and networks necessary, so that NYC/NYS could become more self-sufficient and avoid such distribution disruptions in the future.

One such effort included NYC Mayor De Blasio concluding an agreement that from May 2020, local NYC manufacturers would begin producing 50,000 COVID-19 test kits per week. This agreement also extended to manufacturing PPE: eight companies in Brooklyn and Manhattan signed contracts to manufacture face shields for the city. These eight committed to produce 240,000 face shields per week and were scaling up to reach 465,000 a week by April 24, with an ultimate goal of 620,000 a week. The mayor also noted that five NYC companies were producing 30,000 surgical gowns a week with a goal to scale to 100,000 per week and finally to 250,000 gowns per week, if not more.

NYC has contracted with the NYC biotech company Opentrons to operate NYC's new COVID testing lab. For this project, Opentrons has subleased a space in the Alexandria Center for Life Science on the East Side of Manhattan to locate and operate the facility, called the Pandemic Response Lab. This facility will provide the city with its own coronavirus testing lab in Manhattan, vastly expanding the city's testing capacity and accelerating response times. NYC had also contracted with Opentrons in September 2020 to expand their COVID-19 testing capacity by purchasing and utilizing medical pipettes technology to facilitate local COVID-19 testing processing.

Similarly, on July 30, 2020, NYS Governor Cuomo granted twelve NY companies $6.9 million to manufacture and provide medical products to NYS. Throughout 2020, NY State spent $5 billion on medical devices in response to COVID-19, buying 80 million masks and 8,810 ventilators (roughly $31,500 each):

Item	Total Cost	Total Quantity Ordered	Cost per item
Ventilator	$277,999,973	8,810	$31,555
Coveralls	$195,511,490	2,919,304	$67
Respirators, face masks, N95 masks	$168,459,324	80,330,844	$2
X-ray system	$94,475,700	1,179	$80,132
Ventilator circuits	$71,271,694	414,531	$172
Infusion setup	$48,007,737	1,424,480	$34
BIPAP system	$40,355,505	8,737	$4,619
Gloves	$35,162,284	70,292,950	$1
Disposable gowns	$31,485,963	20,513,900	$2
Oxygen concentrator	$20,399,545	17,308	$1,179
Eye/face shields	$14,948,148	13,918,920	$1
Portable pulse oximeter	$7,676,102	129,544	$59
Soap	$4,009,591	500,004	$8
Oxygen tanks	$3,333,309	60,342	$55
No-touch thermometers	$1,784,443	70,000	$25

Source: New York State Division of Budget

Underinvestment in Public Health Infrastructure:

One key lesson both NYC and NYS learned from the pandemic was that they could no longer neglect investing in their public health infrastructure, as they had been for the preceding decade. A report from the Johns Hopkins School of Public Health found that from 2008-2018, NYS public health care spending remained functionally flat: in 2008, NYS public health total spending per capita was $57 per person; 2018 it was $96 per person (without adjusting for inflation or other spending considerations), which was considered flat spending. Across eight broad public health categories -- maternal and child health, capabilities, environmental, communicable diseases, chronic disease prevention, access to clinical care, injury prevention and others -- New York did not increase its spending in seven categories and increased it only one. In Coronavirus-relevant categories, NYS spending on communicable diseases fell from $13 in 2008 to some $8 per person and functional capabilities jumped to about $29 per person in 2018 from about $6 in 2008. In the subcategory of hazard preparedness and

response, New York spent 3 cents in 2018, barely unchanged from 2008, in which it spent nothing.

COVID spending by hospitals:

NYC's private hospitals have also begun to reassess their infrastructure, and prepare for the next crisis, having learned a few lessons from this one.

"One of the mistakes of previous management practices is not keeping excess inventory because of the risk of medication or equipment expiring," said Mitchell Katz, president and CEO of HHC. "We can't always run hospitals the way many of us were taught, which is to buy supplies at exactly your census and order meds based on how much you used last month, exactly to the dose." He said that the public health system is now maintaining large supplies of PPE and critical medication. This creates an opportunity for the development and sale of an adaptable digital inventory system to the huge NYC public health system, a market opportunity a Dutch firm might consider.

Another clear opportunity for international cooperation is that these hospitals learned to pay attention to foreign medical occurrences and to lay in medical supplies to respond to trends coming in from overseas. For example, in December 2019 when COVID-19 was erupting in China, NYU Langone decided to purchase PPE as a hedge. "It was an expense, but that made a huge difference in March and April," Dan Widawsky (CFO of NYU Langone) said, noting that prices for N95 masks increased tenfold during the pandemic's height. In the future, NYU Langone will consider that prices during a crisis may go up, creating an opportunity for a Dutch firm to offer a cost-effective solution before a crisis ever occurs.

COVID-19 was also a moment of reassessment for Northwell Health, New York's largest healthcare provider and private employer, with 23 hospitals, over 830 outpatient facilities, and 76,000 employees. It persuaded Northwell to reconsider its distribution network. "We had been heavily dependent on China for many of our supplies. But that became an issue when they were hit hard, disrupting our own supplies," said Michael Dowling, Northwell CEO. "Now we've expanded our contacts beyond just China."

The pandemic has led many of NYC's hospitals to see technology as a solution to their revealed shortcomings, which may be a concrete opportunity for Dutch firms. NYU Langone built a real-time dashboard that could trace a patient's path from admission to discharge. It has already saved the health system hours of data gathering and helped it manage its patient capacity. In fact, the digital platform was designed before the

pandemic, but was adapted to suit the crisis. Northwell created a daily dashboard that tracked patient capacity at each facility and updated its procedures for transporting patients between sites safely. New York-Presbyterian used technology to standardize and share medical information across its network. In 2020, it has adopted a new electronic record-keeping system, although, as with NYU Langone, this effort predated the pandemic. It also set up a hotline to provide remote treatment for Covid-19 patients.

Another market opportunity for outside vendors is the new emphasis on staff training of medical personnel at hospitals. NYC hospitals all agree that their medical workers need to receive further training to prepare them to fulfill multiple roles, as well as investing in their mental health and well-being, given what they have just gone through. Few such retraining methods exist, outside of expensive in-person coursework on location at the hospital. If Dutch vendors have such a credible virtual training program or can create one, this may be a fertile field.

Another clear opportunity for Dutch firms is the provision of a digital LSH tracking system for COVID-19 vaccines (and healthcare data more generally) to NYC and NYS . As a result of lacking this fundamental digital capability, neither NYC nor NYS could track for herd immunity, and thus increasingly target areas and populations of need. This was one of the biggest challenges to NYC (and hence is one of the largest opportunities) in preparing for the pandemic, as the dearth of investment in a citywide (or statewide) digital tracking system that could be activated and scaled up quickly carried huge and damaging consequences. As such, NYC had no system in place to track the 3.4 million New Yorkers (and counting) who had been vaccinated as of April 26, 2021. Despite experiences in NYC with the Ebola outbreak, anthrax scares and the H1N1 flu, no medium had been developed that enabled quick contact tracing and containment. Each time, responses had to be cobbled together from the ground up each time, and there had been little lasting change or institutional memory created when each crisis was resolved. This may be one of the largest commercial opportunities available, both in terms of need, price, and prestige.

While NYC and NYS organized much of their vaccination efforts online (managing availability and eligibility through websites), many New Yorkers were excluded, as they lacked the technological resources to participate. This specifically includes the elderly, some low-income populations, and some minority (Black and Latino) populations, and some of these populations overlap. Reflecting this reality, there are an estimated 500,000 NYC households without access to high-speed internet or devices and who therefore cannot participate in purely digital organization and participation. There are also areas of NYC without stable internet or cell service (“digital deserts”), who have

similar challenges engaging with this digital response coordination around COVID-19. In two clinics of the Charles B. Wang Health Center located in Chinatown and Flushing that mainly served older Asian Americans, phone calls were the main medium of signing up for vaccinations and that infrastructure failed under the pressure: "We got over 7,000 phone calls in two hours, and that shut our phone system down." Most of the callers were over 75 years old and did not speak English and there was no other way than by telephone that they could make a vaccine appointment. Thus, the digital divide can dangerously manifest in the public health realm, as well as in the professional, financial, and personal ones.

X. NYC's Digital Health Sector

NYC has one of the most vibrant tech sectors in the world, which has fundamentally contributed to the rapid growth of the NYC digital health ecosystem.

NYC Overall Tech Sector:

NYC's overall tech ecosystem has over 9,000 startups, is valued at $147 billion, and in 2020 was the second most valuable ecosystem in the world. NYC has over 100 incubators for startups, over 200,000 tech businesses with 20 or fewer workers, and employs over 600,000 total employees. Pre-pandemic, over 330,000 people worked in the NYC tech sector. In 2020, NYC technology workers in New York City earned an average of $114,000, up 14% from 2019. This provides a huge and capable talent pool for those companies developing digital health solutions.

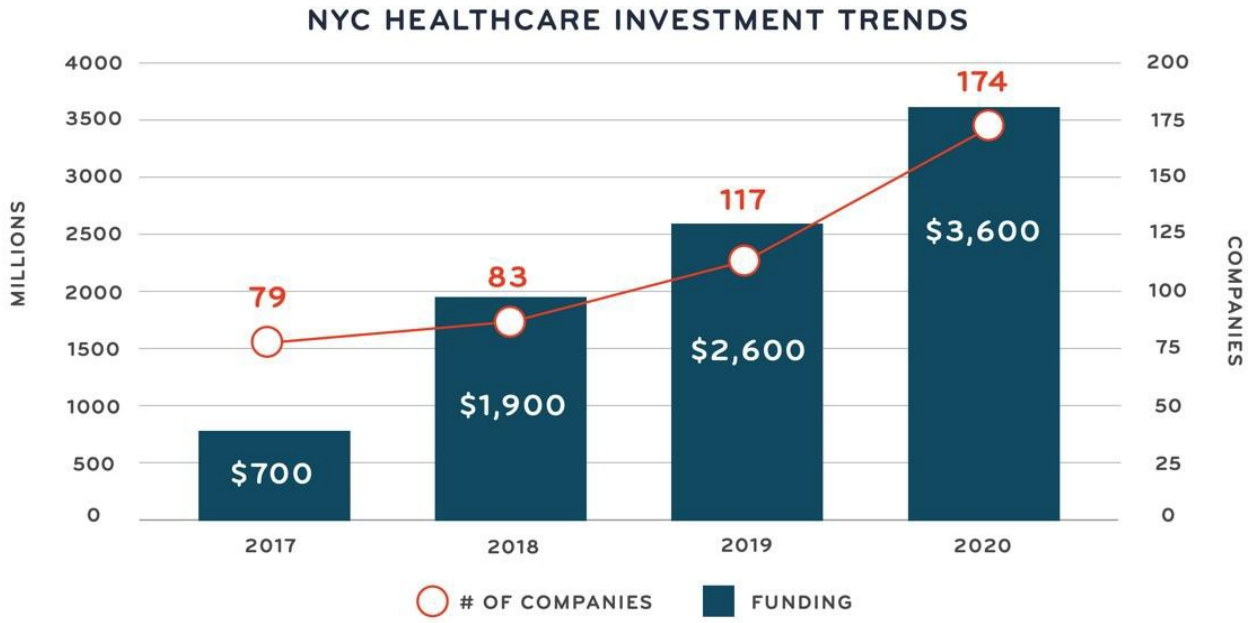
NYC LSH Tech Sector:

In 2019 NYC was ranked the fourth best life sciences startup ecosystem in the world. Today, the city is the nation's second-largest center for digital health innovation, behind only Silicon Valley. LSH Entrepreneurs in the field are drawn to NYC's strong healthcare infrastructure and proximity to the insurance (New York State's insurance sector is America's largest, at $62.7 billion in 2019) and pharmaceutical industries (NYC houses 60% of the US pharmaceutical industry).

Each year, the NYC Health Business Leaders identify the NYC Digital Health 100, the top digital health companies in the city. Their breadth demonstrates the wide penetration this sector has made in NYC.

NYC Digital Health VC Funding:

In 2020, NYC health-related startups received a record $3.6 billion in VC funding, 69% of which went into digital health. This $3.6 billion was an increase of 40% over 2019 and an increase of up over 400% since 2017.

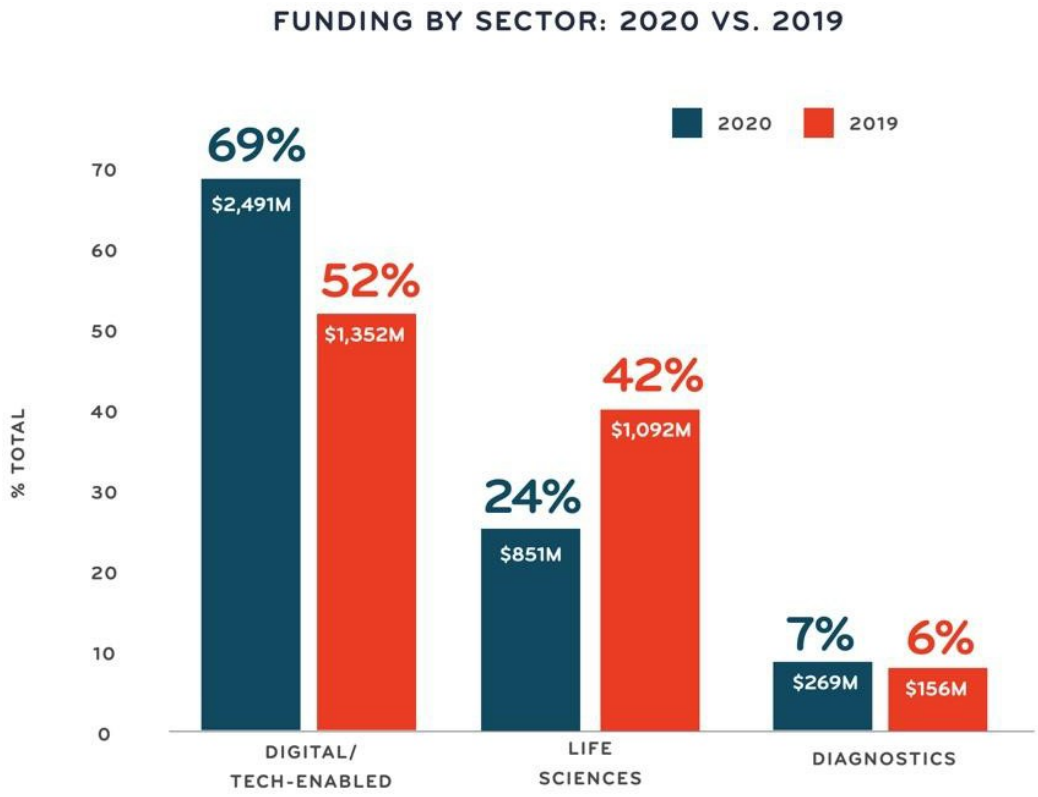


Source

Momentum began to grow throughout 2020 and investment has now begun to flow at a record pace.

Source

This NYC-focused healthcare capital disbursed in 2020 has been driven by a focus on digital/tech-enabled investments, much more so than in 2019; in 2020, 69% of funds were directed towards digital health entities.



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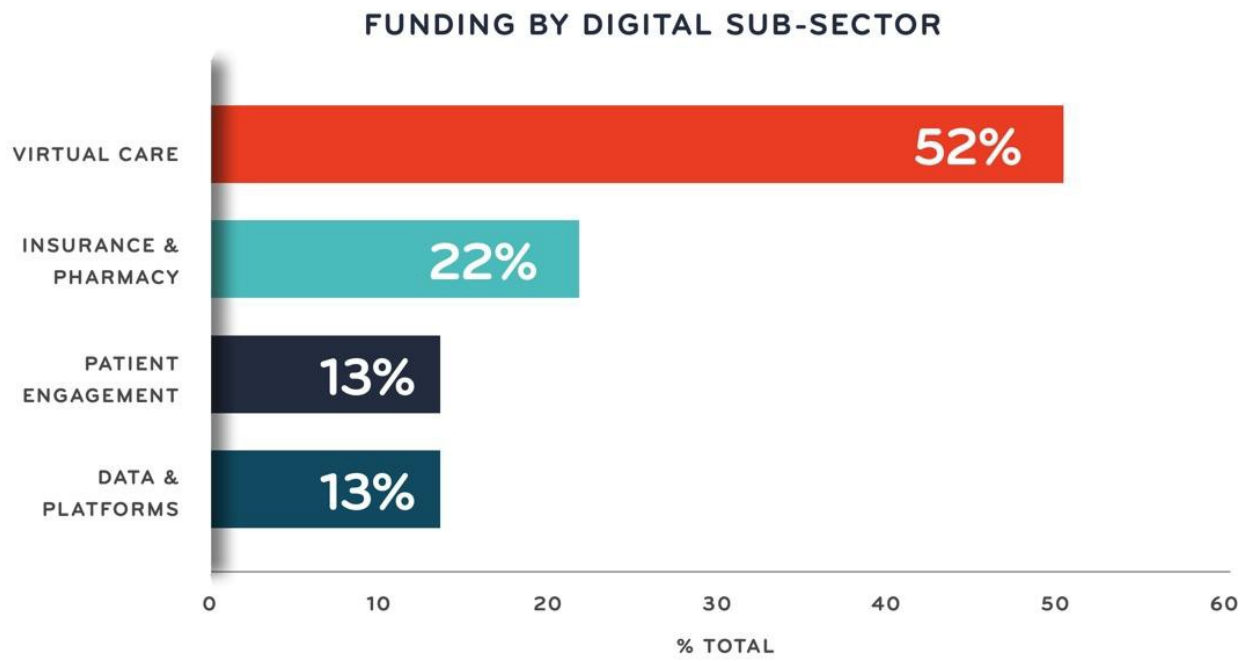
Within digital health, these NYC investments were predominantly targeted on telehealth/virtual care, as a result of the consequences of the pandemic.



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2020 also saw a focus on a different stage of development for NYC healthcare investments. Roughly three-quarters of the 2020 investments were targeted at late stage companies, as the need for operational solutions had been demonstrated, while in 2019, only 53% of investments were focused on late stage companies.

NYC Digital Health Infrastructure:

One important piece of NYC's digital infrastructure is the NYC government's online Digital Health Marketplace platform, which facilitates the matchmaking of medical technology buyers and sellers. This service is intended to improve healthcare quality within the city through efficient selling and purchasing practices and reflects NYC's desire to support the healthcare market through online solutions. This is an excellent opportunity for Dutch companies to integrate into the commercial structure of NYC's LSH sector and seek sales opportunities in NYC.

NYS's government has created SHIN-NY, a secure data network to transmit electronic health records (EHR) and connect medical professionals within New York State. This is currently used by over 100,000 healthcare and community-based professionals and supports the care of millions of New Yorkers. SHIN-NY enjoys participation from **100%**

of hospitals, 77% of clinics, 79% of physicians, 57% of practices, and 86% of long term care providers. Each month, SHIN-NY sends over 10 million alerts regarding care transitions and care management (such as ER trips and hospital visits), patient health records are accessed over 9.2 million times, supporting the care of over 488,000 patients, and diagnostic lab results for over 682,000 patients are electronically shared by treating providers. Any Dutch company considering entering the NYS LSH marketplace involving the transmission of electronic health records should immediately assess whether its proprietary digital formats comply with SHIN-NY and adapt to this standard as quickly as possible.

Using SHIN-NY to access patient information has been associated with reducing hospital admissions by 50%, Emergency Department admissions by 26%, and repeating imaging procedures by 35%. In total, it is estimated that SHIN-NY saves the NYS healthcare community, Medicaid and Medicare, and its patients $160-195 million each year.

Another interesting element of NYC's LSH infrastructure is the NY Digital Health Innovation Lab. A collaboration between the Partnership Fund for NYC and the NY eHealth Collaborative, from 2012-2017 it managed five accelerator programs for growth stage digital health companies developing cutting edge IT solutions for major healthcare providers and payor organizations. 27 companies participated in the program and each winner received product feedback and mentoring from senior executives at participating companies, as well as from the Lab's network of venture investors, sponsors and advisers. In 2018, the lab began to focus more on developed solutions and worked more with their graduates to ensure their growth and success. After graduating from the program, the alumni companies raised more than $390 million, participated in over 50 pilots, and created nearly 400 jobs.

Telehealth as the Breakout Digital Health Technology:

The pandemic has sparked an aggressive effort to advance digital health technologies and practices in all its forms, however there has been one clear standout. The extraordinary emergence of telehealth as the pandemic's indispensable solution has focused the attention of government, tech, and finance on promoting its development and growth unlike any other element of digital health. Through technology, telehealth grants access to those in quarantine but also those who have no proximate access to medical facilities. COVID-19 has accelerated both funding and adoption of digital health technology, and telehealth in particular, in a fashion unthinkable only 18 months ago.

Federal Regulatory Changes Regarding Telehealth:

One of the most important federal COVID-19 regulatory changes came in March 2020, when Medicare and Medicaid temporarily suspended their restrictions on covering telehealth visits from home and began reimbursing medical facilities and physicians for these interactions. Until that time, the federal Medicare and Medicaid programs would only financially reimburse telehealth appointments if they took place in a doctor's office or other accredited medical facility. It was this change that permitted the explosion of telehealth as the central method of dispensing mass health care in the US during the pandemic. This expansion of federal and state coverage to telehealth visits in non-facility locations has long been the most important obstacle to widespread US adoption of telehealth, and was a change lobbied for by the American Telemedicine Association (ATA) since its inception in 1993.

Also in March 2020, Congress passed a provision that waived some restrictions for Medicare telehealth coverage as part of the American Rescue Plan.

In addition, the Federal Communications Commission received $450 million to provide subsidies to equip US healthcare providers with telehealth technologies and to provide implementation support during the pandemic. It has already disbursed $200 million of this funding and is seeking opportunities to distribute the second tranche of $250 million. This is a clear area where Dutch companies might offer innovative and substantive telehealth services and products to NYC medical facilities, which could be subsidized by this new federal funding stream.

Telehealth Usage Increases As a Result of Regulatory Change:

As a result of these federal regulatory changes and subsidies, in Q1 2020, US telehealth use increased 50% over Q1 2019, in the first months of the pandemic it increased 150%, and three of every four emergency visits were conducted via telehealth. After CMS issued its suspension of its rules, telemedicine use jumped to 50% of Medicare users, from under 1% in 2019. The effects were particularly effective among the senior and lower-income demographics: from March-June 2020, 26% of Medicare users and 34% of those who were eligible for Medicare and Medicaid (seniors over 65 or with disabilities with a low income) had telehealth visits. The Johns Hopkins Medicine network of clinics in Baltimore went from delivering fewer than 70 telehealth visits per month to up to 90,000 per month.

This regulatory liberalization led to rapid utilization of telehealth in the US. In the first 6 months of 2020, half of Medicare visits were delivered online or by phone. Before the public health emergency, approximately 13,000 beneficiaries in fee-for-service (FFS) Medicare received telemedicine in a week. In the last week of April [2020], nearly 1.7 million beneficiaries received telehealth services. In total, over 9 million beneficiaries have received a telehealth service during the public health emergency, mid-March through mid-June [2020]. In 2019, 11% of US consumers reported using telehealth; in 2020, 46% of US consumers did so. US medical service providers have rapidly scaled their virtual offerings and are seeing 50-175 times the number of patients via telehealth that they previously did. According to a usage study at NYU Langone hospital in NYC, from March 2nd to April 14th 2020, virtual urgent care visits increased from 102.4 daily to 801.6 daily. (683% increase) and nonurgent care virtual visits increased by 4,345%. For these reasons, Frost & Sullivan forecasts a sevenfold growth in telehealth by 2025 – a five-year compound annual growth rate of 38.2%.

The Global and US Telehealth Markets:

For telehealth, COVID-19 has changed everything. The 2019 global telehealth market was estimated at $61.4 billion ($26.14 billion in the US); by 2027 it is projected to reach $559.52 billion, with a CAGR of 25.2%. Pre-COVID, the total annual revenues of US telehealth firms were estimated at $3 billion. McKinsey now estimates that up to $250 billion of current US healthcare could potentially be virtualized (McKinsey estimates that 20% of ER visits, 24% of healthcare office visits, and up to 35% of regular home health attendant services, and 2% of all outpatient volume could be virtualized). Some estimate that 20-25% of all care in the future could be delivered remotely.

Teledoc Health Inc., Amwell, and MDLive are three of the top actors in this sector, North America is expected to hold the highest share of the global telehealth market, and a key trend is the increasing number of startups entering the telehealth space (though there are already hundreds of US telehealth companies).

Telehealth Visits Are Reimbursed by Insurance for Less than In-Person Visits:

One sensitive fiscal issue is that telehealth visits are not reimbursed at the same levels as in-person doctor visits by health insurances. So while these telehealth visits are now temporarily covered by Medicaid and other state health insurance regulations, some medical facilities are leery of relying on them, as they see it as a drain on their ongoing operations when their operating margins are already so thin.

That said, during the pandemic, hospitals have been generating a good deal of revenue from telehealth (compared to being permitted to do so little in person), allowing them to provide care while their patients stay home and keep their medical staff safer. Though, as reimbursement rates for virtual care are not yet on par with those for in-person services, some doctors are opting not to use it, but the trend is toward mass adoption. Telehealth visits at NYU Langone surged to over 7,000 calls per day during the height of the pandemic, but has now fallen back down to some 600 per day.

Telehealth Popularity with US Consumers and Providers:

Telehealth is enormously popular with US consumers. 92% of Johns Hopkins' patients surveyed found telehealth visits as good, better, or much better than in-person visits. A recent survey of US patients found that 84% were more likely to select a provider that offers telemedicine over one that does not. Furthermore, surveyed telehealth usage was highest by patients 20-44 years of age, particularly for urgent care, strongly implying that this consumer-driven trend will continue for decades.

70% of US healthcare providers surveyed reported being motivated to use more telehealth as a result of their experiences during the pandemic, 11% said they are now using remote patient monitoring platforms to monitor their patients in their homes. Over 75% said they wanted to continue using telehealth for chronic disease management, about 70% wanted to use these platforms for medical management, about 62 percent cited care coordination, about 55 percent cited preventative care, about half cited hospital or ED follow-up, about 44 percent cited specialty care and roughly 45 percent cited mental or behavioral health. Over 90% of these providers reported that they had averaged five or fewer telehealth visits per week prior to COVID-19 and after March 2020, nearly 25% were averaging 11-20 virtual visits per week and nearly 40% were averaging over 20 virtual visits per week.

Use of Telehealth Platforms and the Relevance of Distance:

Of those medical providers surveyed, over one third reported using Zoom to connect with patients during the pandemic, while roughly 30 percent using an audio-only telephone and almost 20 percent using Facetime. Fewer than 20 percent used a telehealth vendor.

Telehealth directly addresses a key issue of in-person medical care: the distance from a medical facility. Rural Americans live an average of 10.5 miles from the nearest hospital, compared with 5.6 miles for people in suburban areas and 4.4 miles for those in urban areas. Overall, 18% of Americans live more than 10 miles away from their nearest hospital, while 24% live between 5 and 10 miles away and 58% live less than 5 miles away. It takes an average of 19 minutes for the quarter of urbanites who have the longest travel time to an acute care facility, compared with five minutes for the quarter of urban Americans who live closest to one.

It is for this reason that telehealth is both enormously attractive both to America's largest city and its tinies rural communities. Dutch companies should consider approaching both ends of this spectrum.

Telemental Services:

Telemental health services have exploded during the pandemic, currently worth $3.5 billion in the US and now projected to reach $15.5 billion by 2026. According to Dan Trencher, a product and strategy leader at Teledoc, "Mental health is an area that we've seen perhaps the greatest growth over the last year. In addition to consumers not feeling comfortable going in person, there's also access challenges in general with mental health, particularly around psychiatry." According to the NYS Health Foundation, "poor mental health has remained high throughout the pandemic, reaching 37% of adult New Yorkers in October 2020." Furthermore, "young adult New Yorkers (ages 18–34 years) reported the highest rates (49%) of poor mental health in October 2020." This high observed rate of poor mental health demonstrates the increasing demand for telemental health services.

Telehealth is also increasingly being used for non-acute wellness issues. Companies such as Hims, Hers, Curology, and Roman, now offer easier and covert access to physicians willing to write prescriptions for more private wellness concerns, including baldness, acne, erectile dysfunction, and birth control.

For these reasons and COVID-19, digital health companies have been attracting tremendous interest from investors. In 2020, $14.8 billion in equity was raised across 637 deals, as well as $6.8 billion in debt and public market financing across 26 deals. However, telehealth received the lion's share, with $4.3 billion in 2020, up 139% from 2019. According to Raj Prabhu, CEO of Mercom Capital Group: "COVID-19 supercharged funding activity in digital health in 2020. Ten digital health categories had their best year with record funding amounts."

The pandemic has forced the government to adapt its procedures regarding telehealth. In March 2020, Medicare and Medicaid temporarily suspended their strict limitations on covering and reimbursing for telehealth visits. The American Medical Association updated its ethical guidelines for telemedicine.

New York City and New York State Regulatory Responses to Telehealth

Both NYC and NYS governments are aggressively eliminating obstacles to and promoting telehealth policies, in order to reduce pressure on their healthcare infrastructures during the pandemic and to reduce costs and raise efficiencies in the near term. Both the city and the state recognize telehealth's potential to reduce potential COVID-19 contagion and reduce pressure (and costs) on emergency rooms, using telehealth as "forward triage". These governments see telehealth as a process by which they can screen patients remotely (rather than in person), to triage patients with cold/flu symptoms, and remotely provide care for those who do not need in-person treatment and so can remain at home. New York State Governor Andrew Cuomo is aggressively promoting a new law (which would apply to NYC as well) that would:

- Require NYS Medicaid telehealth reimbursement for services in a non-medical facility settings;
- Develop interstate licensing reciprocity for Northeastern US states for specialties with a shortage of access;
- Continue COVID-19 flexibilities for mental health and substance use disorder services;
- Require commercial health insurers to offer a telehealth program to members, and provide Medicaid coverage, subject to federal approval, to cover services furnished telephonically when medically appropriate;
- Ensure that telehealth is reimbursed at rates that incentivize use when medically appropriate;
- Require providers to disclose to patients in writing or through their websites whether they provide telehealth services, require insurers to provide up-to-date information in their provider directories about which providers offer telehealth services. Any telehealth platforms offered as part of a mandatory telehealth program will be required to participate in SHIN-NY or otherwise demonstrate interoperability with other providers in the insurer's provider network.
- Require insurers to offer members an e-triage or virtual emergency department platform that enables individuals to receive a symptoms assessment and a referral to a network of providers or a nearby Emergency Department when

warranted, allowing New Yorkers, particularly in underserved areas that lack health infrastructure, to receive better and faster care in times of emergency;
- Facilitate the use of expert consultations between providers via telehealth by encouraging insurers to reimburse providers directly for engaging in e-consults or permitting the inclusion of insurers' costs associated with e-consult platforms within the health care service costs.
- Streamline the SHIN-NY [NYS electronic data sharing] patient consent process to increase interoperability and record access amongst health care providers.

Specifics of NYS Telehealth Laws:

Both the New York Insurance Law and the NY Public Health Law define telehealth as *"The use of electronic information and communication technology to deliver health care to patients at a distance."* These laws explicitly exclude audio-only, fax-only, and messaging-only transmissions (so no text-only services are permitted). In short, the remote services must include audio-video appointments for the purpose of assessment, evaluation, diagnosis, and treatment (currently, audio-only appointments are permitted).

In NY State, telehealth is explicitly limited to three modalities:
1. Telemedicine;
2. Store-and-forward (i.e. transmitting electronic health records);
3. Remote patient monitoring

Regarding patient consent, New York law dictates that informed patient consent is only necessary when providing telepsychiatry services.

The following medical professionals are permitted to offer medical services in New York State:
- Physicians
- Physician assistants
- Physician specialists, including psychiatrists
- Psychologists
- Nurse practitioners
- Registered professional nurses
- Diabetes educators
- Asthma educators
- Podiatrists
- Optometrists
- Dentists

- Speech-language pathologists or audiologists
- Midwives
- Hospitals
- Hospices
- Home care service agencies

The services they may provide include:

- Assessment
- Diagnosis
- Treatment
- Consultation
- Education
- Care management
- Self-management of a patient

Limitations of Telehealth:

There is a recognition at key levels of NYC government, tech, and business of some key limitations of telehealth:

- An inability to perform medical tests;
- A potential lack of technology at both the medical facility and by the patient;
- A potential inability to access broadband internet access.

Given telehealth's importance, other Northeastern states, such as Massachusetts, New Jersey, and Delaware, have also updated their telehealth laws.

In short, telehealth has emerged as the single most important piece of LSH technological innovation for the application of public health as a result of the pandemic. Dutch telehealth companies should focus on the evolution of the US market, as it is an enormous and lucrative market opportunity.

XI. NYC Accessible Medical Technology for Sustainable Health and Care

Both NY State and NYC are focused on integrating accessible and personalized medical technologies, as well as other technologies, in order to reduce the costs of public healthcare and to create and maintain the ability to access them in times of crisis.

For the next eighteen months, however, it is highly likely that this will be a secondary priority for the public and the private sector. As previously stated, the primary policy goal of both city and state government, as well as private medical facilities as well, will be to adjust to the COVID-19 pandemic. It may be likely that discretionary efforts regarding public health care will be focused on recovering from this pandemic and preparing the public healthcare infrastructure for future pandemics/challenges, rather than committing energy and attention to adjusting its own current healthcare configurations.

To be sure, there will be opportunities in this area, however they will likely trail those in the digital health/telehealth subsector.

For this particular issue, a clear target is the NYC city government and the NYS state government, both of whom have considerable incentives to tame the ever-growing cost and inefficiencies of public healthcare. There are also opportunities in the private sector space, such as creating a COVID-19 digital health pass to permit people to enter large public and commercial spaces, as Madison Square Garden and the Barclays Center have already begun to utilize.

NYS Demographic Challenge

NY State is grappling with the fact that its population is growing older, with attendant higher ongoing medical costs. In 2019, 16.4% of New York State's population was 65 years or older; by 2035, 20% of New Yorkers are expected to be 65 years old or older. As such, this could be an important opportunity for these governments to apply technological solutions to a larger demographic management challenge.

The typical American spends over $300,000 over a lifetime on medical care. Health care costs increase exponentially after age 50 and the annual costs for the elderly are approximately four to five times those of people in their early teens. Those 85 or older consume three times as much health care per person as those 65–74, and twice as much as those 75–84. Nursing home and short-stay hospital use also increases with age, especially for older adults. A critical finding is that nearly 60% of this total lifetime

medical cost of survivors ($188,658) is spent after age 65. It is further noteworthy that one-third of this amount is likely to be spent after the age of 85. Thus, with New York State's population aging relatively rapidly, these future medical costs will become unsustainable and that there will be a valid market for key technologies and services that can reduce the ongoing cost of elder care in a systemic fashion.

NYC Managed Care Efforts

Medicaid reforms have had a significant effect on moving New Yorkers into value-based care, in an effort to provide better care and to reduce costs. In 1997, federal Medicaid managed care programs became mandatory (instead of fee for service programs) with healthy children and adults under 65, and since then came to include other covered groups (any children, disabled, or aged New Yorkers eligible for Supplemental Security Income, people with HIV/AIDS, seniors needing community-based long-term care who were eligible for both Medicare and Medicaid).

NYC has made a tremendous effort to move its population into managed care plans, to both prioritize better preventative care and health levels, while reducing costs. In 2009, 73% of NYC Medicaid enrollees were in managed care plans (2,011,143 people in managed care, compared to 734,458 for fee-for-service); by 2018, it had reached 80% (2,792,743 in managed care, compared to 688,864 in fee-for-service). This is a significant opportunity for Dutch companies, if they can offer such services that help fulfill the dual mandates of preventative care and cost reduction.

Preventative Health Programs:

All New York State counties were required to submit a Community Health Improvement Plan (CHIP) to improve their health care situation through investments in prevention, in concert with NYS's Prevention Agenda and how they would collaborate with health care institutions, local health departments, and community-based organizations to achieve their goals.

To promote the implementation of the CHIPs, NYSHealth issued a Request for Proposals (RFP), "Advancing New York State's Prevention Agenda: A Matching Funds Program to Implement Community Health Improvement Plans," to support local health departments with the most innovative and feasible projects in executing their plans. Through this RFP, NYSHealth invested $500,000 in 17 organizations to help 27 county health departments advance the goals of the Prevention Agenda.
NYSHealth also provided two grants totaling $549,977 to the New York Academy of Medicine to offer technical assistance to the local health departments and their

community-based counterparts as they launched and carried out their CHIPs. As a result, counties put into action a wide range of prevention efforts, such as increasing breast-feeding, reducing asthma-related emergency department visits, implementing Complete Streets policies, preventing falls among elderly New Yorkers, and providing nutrition education in schools.

Personalized Medical Technology:

Personal health monitoring will be a primary driver of the next wave of growth of the personal health technology device market. It will cause global revenue to grow by nearly $5 billion during the next five years, reaching a total of over $15.7 billion in 2023, up from $10.9 billion in 2019. It is further estimated that the global wearable medical device market size was $14.44 billion in 2019 and will hit $89.45 billion by 2027 (by comparison, the global telehealth market is estimated by 2027 to reach $559.52 billion).

Other personalized medical technology includes genomic analysis, such as the NYC firm Allelica, which recently raised $1.75M in seed financing to implement their "Polygenic Risk Score (PRS) Analysis into Clinical Practice." This measures an individual's level of risk of chronic diseases based on their gene structure. With this personalized technological solution, populations can be stratified and precision medicine at scale could conceivably be achieved.

Imaging Diagnostics and Point of Care diagnostics

The global clinical diagnostics market was valued at approximately $63.3 billion in 2020, and is expected to reach $93.8 billion by 2026, registering a compound annual growth rate (CAGR) of 6.1% during the forecast period, 2021-2026. With the emergence of the SARS-CoV-2 virus, there has been an increase in lab testing, which saw demand grow even more in an attempt to keep pace with the suspected cases of COVID-19. The demand for clinical diagnosis has grown to 26-50%. The World Health Organization reported an estimated rise in the prevalence of chronic disease by 57% by 2020, and 60% of this burden is expected to occur in emerging markets, necessitating ongoing clinical testing in multiple countries.

On July 22, 2020, Nanowear announced a COVID-19 remote diagnostics research collaboration with Hackensack Meridian Health Systems in New Jersey and Maimonides Medical Center in Brooklyn, NY. The partnership focuses on understanding remote diagnostics monitoring through cloth-based wearable technology. "The goal is to monitor patients with confirmed or suspected COVID-19 with Nanowear's proprietary

and patented cloth-based nanosensors which detect physiological and biomarker changes indicative of clinical deterioration that may require further intervention from the hospital systems."

Koios Medical (an artificial intelligence software company) received a breakthrough device designation from the FDA for their early breast and thyroid cancer detection software. "The company's software is the first of its kind… to consistently improve cancer detection...reducing avoidable false positive benign biopsies."

An interesting development is that New York City will continue to expand on their use of vending machines that sell at-home COVID-19 test kits. The company that primarily provides these machines, Wellness 4 Humanity, plans to continue adding their machines in easily accessible spots throughout NYC.

Medical robotics (surgery, rehabilitation)

These machines work in the surgical room and assist doctors with various tasks leading to better incisions, surgical movements and post-surgery recovery. It is expected that the US market for surgical robots will grow by 7.2% from 2015 -2020. A key player in this market is Intuitive Surgical (creator of the da Vinci system, which was approved by the FDA in 2000).

In 2021, the NYU College of Dentistry became the third dental school in the entire nation to utilize robotic devices for dental implant surgeries. This reflects the openness and forward thinking NY has towards adopting technology for medical solutions.

Exoskeletons

According to a report by Verified Market Research, the global exoskeleton market is expected to have a calculated annual growth rate (CAGR) of 35.9%. More specifically, it will grow from $170.84 million in 2020 to $2.48 billion in 2028.

The City University of New York, City College (CUNY) has partnered with the University of Texas Health to develop a lower-body device for seniors needing to gain bodily mobility. This is a relevant development in the exoskeleton segment of NYC. "Plans now call for the prototype to be tested on seniors who have gait or stride difficulties. It is hoped that the final version of the device could be worn under the user's clothing."
In addition, Mt. Sinai and Helen Hayes Hospital offer exoskeleton device programs for individuals with conditions that impact their walking capability.

Care Robots

This form of medical technology provides assisted care to elderly and disabled individuals. Currently, this technology performs simple tasks like helping individuals get in and out of bed. However, this sector is experiencing innovation, leading to the actions of more complex tasks like reminding patients to take medication, providing patient emotional support or helping in-home nurses complete multiple tasks. In June 2019, the NYC Department for the Aging (DFTA) partnered with the NY State Office to support a robotic pet pilot program. Within this program, robotic pets are given to the elderly in the hopes of combating depression and social isolation.

Hospital Robots

This form of medical technology is intended to assist with day to day hospital activities like moving medications, laboratory specimens and other sensitive material. In addition to this, they can disinfect entire patient rooms. Mount Sinai Hospital of New York utilizes OhmniLabs telepresence robots to cut the spread of COVID-19 while expanding doctor presence/access.

In November 2020, Coney Island Hospital was given $2.6M in NYC funding to purchase a robotic surgical system. The Da Vinci robotic-assisted surgery system can be utilized for various minimally invasive procedures and has already been used in “the areas of gynecology, urology, thoracic, colorectal and general surgery.” Similarly, the Brooklyn Hospital Center (TBHC) Department of Surgery performed over 1,000 robotic surgical procedures with the Da Vinci robotic-assisted surgery system.

Neurotechnology

The global neurotechnology market was estimated at $9 billion in 2018 and is expected to reach $19 billion by 2026, with a CAGR of approximately 15%. Nearly 400 incidents of traumatic brain injury occur daily in New York State. Each year, TBIs result in more than 2,000 deaths, 19,000 hospitalizations, and over 112,000 emergency department visits among New York State residents. Risks are greater for young children, young adults (males) and the elderly. These figures detail the increasing demand for neurotech in the NYS health care sector.

Mindmaze (Brain Tech / Switzerland Company) partnered with Mt. Sinai Health System to launch “an innovative at home tele-neurorehabilitation program for stroke patients,

utilizing the FDA-cleared and CE-marked MindMotion GO™. With this first-of-its-kind mobile neurorehabilitation therapy system from MindMaze, patients can continue their recovery at home with virtual support from clinicians at Mount Sinai's Abilities Research Center (ARC). This initiative expands patient access to MindMotion GO, which has been adopted by the Rehabilitation Innovation team at Mount Sinai since June to provide critical neurorehabilitation across the continuum of care."

Artificial Intelligence (AI):

NYC has been an international center for AI investment and startup companies across all disciplines, from LSH to finance, advertising, and more. Four of the seven giants of the AI world (Google, Microsoft, Amazon, and Facebook) all have located AI personnel in NYC (the other three giants are Baidu, Tencent, and Alibaba, and are all located in China).

The global market for AI in the healthcare market was estimated at $3.99 billion in 2019 and is projected to reach $107.8 billion by 2027, with a CAGR of 49.8% during 2020–2027.

NYC is a strong location for AI, as NYC has the highest concentration of AI/machine learning jobs in the US, even more than San Francisco. AI investment in NYC has increased dramatically: In 2012, some $2.3 billion was invested in tech startups in NYC. By 2017, it was $13 billion. This is a rapidly growing sector, where NYC has considerable advantages in access to capital and local tech talent. That said, the limits on artificial intelligence are firmly located in the limits of human wisdom.

On behalf of NYS, on July 24 2019, Governor created a temporary commission to study how the state government can best utilize artificial intelligence in multiple fields as well as prepare for any dangers by studying AI's impact on employment, personal information capturing and other unsafe practices.

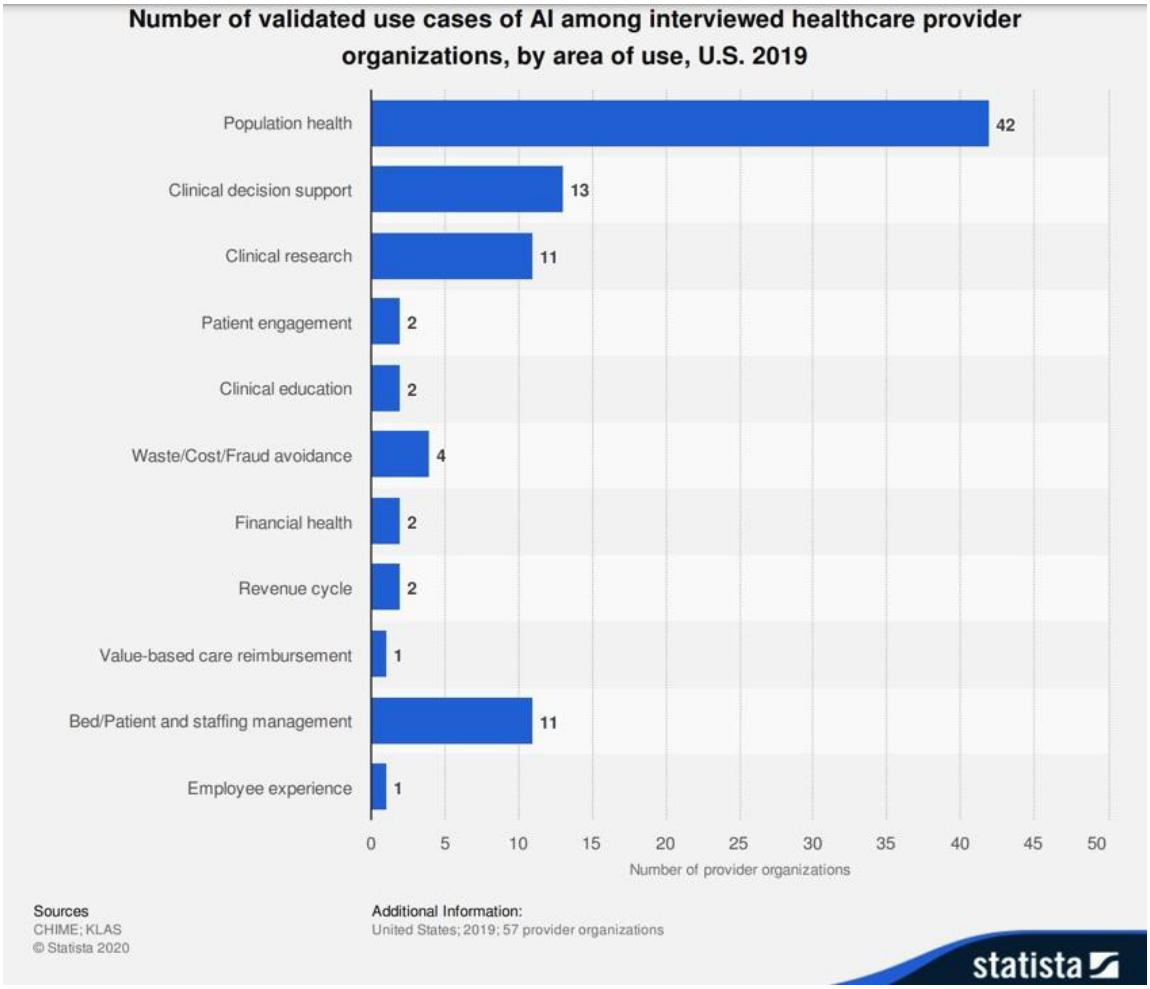
NYS government will provide a $300,000 grant to Blue White Robotics as they establish an office in NY and support first responders by providing autonomous (AI) delivery technology.

For LSH, this is clearly an area of potential growth, particularly in the area of clinical testing and analysis. Given the scale of NYC's generation and consumption of medical data, effective AI-enabled analysis will likely have a warm welcome.

AI is now being integrated into larger, more innovative LSH research programs. The Mount Sinai Health System is taking the lead, with the scheduled opening in 2021 of the Hamilton and Amabel James Center for Artificial Intelligence and Human Health, dedicated to research, development and implementation of artificial intelligence for healthcare. It will have some forty principal investigators of various disciplines on hand for opening, as well as 250 graduate students, postdocs, computer scientists and other support staff. Mount Sinai also launched in September 2019 the Biomedical Engineering and Imaging Institute (BMEII), which will leverage Mount Sinai's imaging and nanomedicine programs to create medical inventions in the fields of imaging, artificial intelligence, robotics, sensors, and nanomedicine.

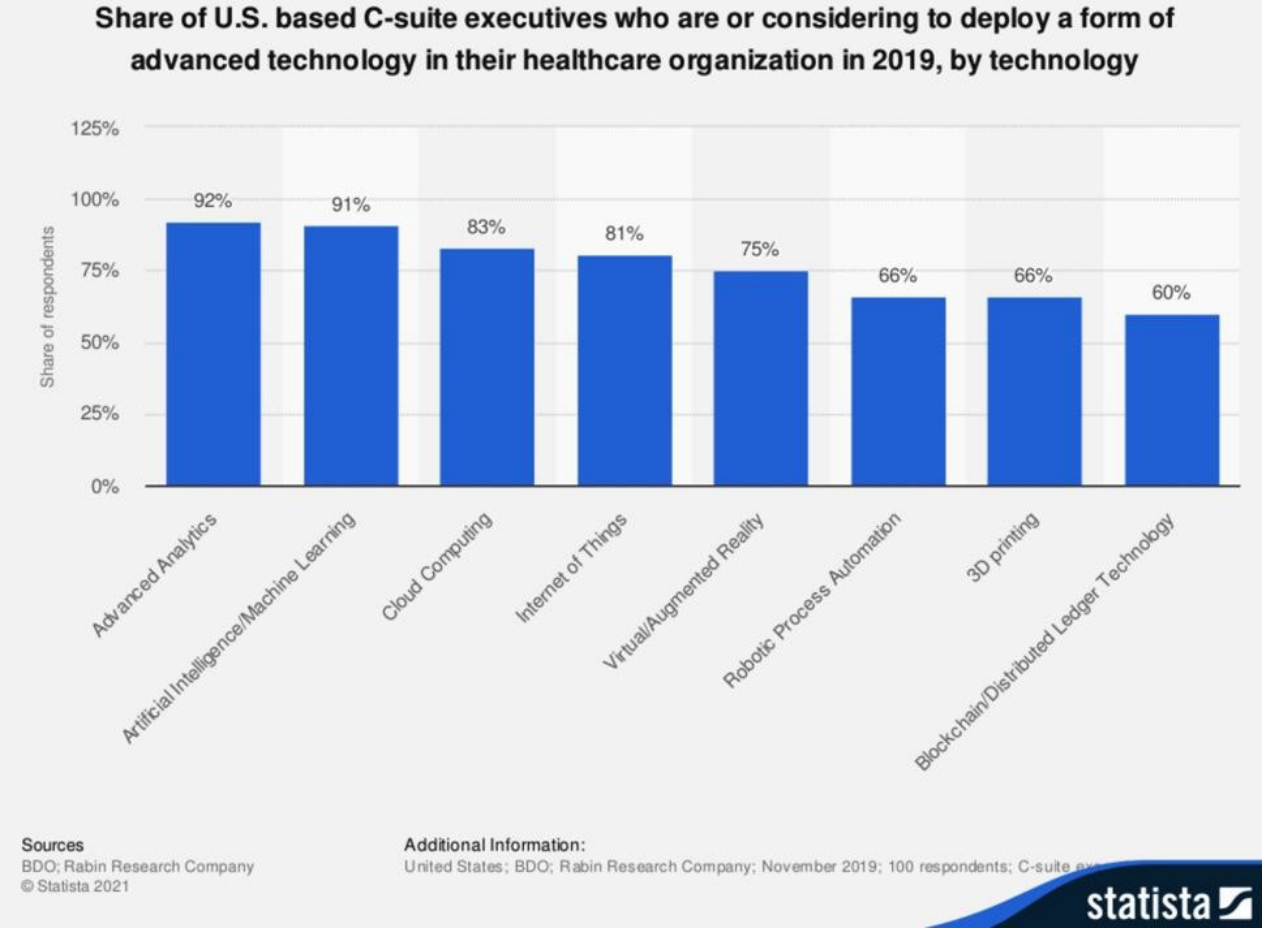
A large-scale study found that an AI-powered COVID-19 management software by RADlogics reduced turnaround time in data creation and abnormal findings in x-rays. The study found that the introduction of RADLogics' AI-Powered solution into radiology workflow to analyze Chest-CT scans during the COVID-19 pandemic reduced report turnaround time by an average of 30%, which is equivalent to 7 min per case.

The chart below shows the 2019 US validated use cases of AI among US healthcare providers, with a particular focus on population health (certainly relevant to NYC).



Source

This push to integrate AI in healthcare is reflected by the strong responses from US C-suite healthcare executives, who recognize AI's power to bring efficiencies and reduce costs in US healthcare, with over 90% of the respondents either deploying or considering deploying AI/machine learning in their healthcare organization:



Source

AI engagement has been affected positively by the pandemic. According to a report done by Center for Connected Medicine, 44% of 117 executives representing 112 healthcare provider organizations believed that the COVID-19 pandemic will cause an increase in healthcare investment towards AI approaches (a further 44% thought that COVID-19 would have no effect on AI investment).

As of 2020, there are a total of 129 AI Healthcare startups within NYC: below is a brief summary of ten AI healthcare startups in NYC that have received interest and funding:

1. Schrodinger:
   A software company utilizing AI within their online scientific platform to better design small molecule drugs, biologics and other materials. Their total funding is $162 million.

2. One Drop:
   A healthcare firm incorporating AI within their online mobile application offering. More specifically, the mobile application automatically schedules medication reminders, provides health coaching assistance and offers AI-based real-time healthcare predictions. This service is directed towards individuals suffering from a chronic illness. Their total funding is $73 million.

3. PAIGE:
   A computational pathology firm that offers AI-based digital diagnostics through an interoperable enterprise imaging platform. This is intended to better diagnostic confidence and improve pathology workflow. Their total funding is $162 million.

4. Pager:
   A medtech firm that offers an online mobile application for on-demand doctor house appointments. In relation to artificial intelligence, Pager leverages AI to automate administrative tasks and clinical workflows for command center workers with the intention of increasing productivity. Total Funding: $67 million.

5. Cota Healthcare:
   A data collection firm that utilizes AI within a patented system, essentially organizing complex data to create a clearer picture of cancer that can be leveraged to advance research and care. Total funding: $65 million.

6. AiCure:
   An AI firm that utilizes machine learning and computer vision technology to advance the quality of patient medication adherence within the clinical

trial setting. Their AI software also develops predictive models surrounding future clinical research site performance. Total funding: $52 million.

7. Spring:
   This firm offers an AI-based platform to patients, providers and payers that will offer optimized medication predictions for individuals suffering from depression and other mental illnesses. Total funding: $30 million.

8. Belong:
   This firm offers a cancer care management application that assists cancer patients with managing and mitigating their condition. In terms of artificial intelligence, Belong leverages the algorithms of AI to hyper-personalize the experience of end to end patient solutions. Total funding: $30 million.

9. Imagen Technologies:
   A technological diagnostic and imaging firm that offers an AI-based solution to better detecting meaningful pathologies within medical images. This solution intends to advance early disease identification, leading to improved patient care. Total Funding: $28 million.

10. HealthReveal:
    A chronic disease management firm that offers an AI-based tool to help guide clinicians through the clinical decision making process. More specifically, HealthReveal analyzes the health of patients who are at-risk and provides guidance in diagnostic and treatment. Total Funding: $27 million.

Other NYC institutions are also making efforts in the AI healthcare space.

As mentioned above, Mt. Sinai is making tremendous efforts in the AI healthcare subsector. On May 19, 2020, it was reported that Mt. Sinai would be the first in the nation to utilize artificial intelligence through the use of imaging and clinical data on COVID-19 patients. More specifically, Mt. Sinai will use a unique algorithm that will detect COVID-19 by observing the state of one's lung disease through computed tomography (CT) scans of the chest area. This development further adds to how AI is being adopted as a solution in NY to combat and mitigate the spread of COVID-19.

The Catholic Health Services of Long Island announced on April 6, 2020 that they would use an AI algorithm sourced from NJ company, ElectrifAi, to assist in determining whether an infected COVID-19 individual should be sent home or admitted to the ER.

NYC-Based firm, K Health utilizes artificial intelligence within their primary healthcare centered app that anonymizes health records to augment the diagnoses of health problems. More specifically, K Health leverages AI-driven health data to create a predictive model that will allow individuals to learn more about their health by comparing themselves with other similar individuals. Recently, K Health reported $48 million in Series C funding. In total, K Health has raised $97M since 2016. This funding reflects the interest in AI in healthcare within NYC.

The NYC firm, Inspiren, is a key healthcare startup utilizing AI to better patient care quality and efficiency. Their automated product (AUGi) is a patient monitoring system that leverages AI vision technology. Essentially, AUGi is installed within a patient care environment and digitally monitors everything within its view, notifying nurses of when a patient is in bed, stands up or possibly falls. AUGi also records data that informs nurses how long someone entered the space, how long someone visited, and if PPE was being worn throughout the duration of the visit. This AI-driven product may play a role in mitigating COVID-19 and better protecting healthcare workers through contact tracing.

Early Health Technology Assessments:

Beyond AI, there are movements in the early health technology assessment space. According to Polaris Market Research, the global virtual clinical trials market is expected to reach $13.78 billion by 2027 with a compound annual growth rate (CAGR) of 12.6%.

TMRW Life Sciences is a NYC fertility technology company that provides "...the first-ever automated platform for the management, identification, and storage of the frozen human eggs and embryos." In 2019, the company raised $39 million within two rounds of funding for the development of this technology. With TMRW's technology launching in February 2021, "U.S. fertility clinics [reported] as much as 50% increases in cycle volume over the same period last year." Furthermore, "Clinics accounting for more than 30% of all U.S. IVF cycles are scheduled to install the TMRW platform in 2021."

Medidata (NY Company) recently announced an additional service to their online risk management platform within their Medidata Clinical Cloud to assist with clinical trial patient safety / practices.

Appendix I: Pre-Arrival NYC LSH Resources for Dutch Companies

Here are a series of NYC incubators and programs that Dutch companies may apply for and use, even before they arrive in the United States:

- **Alexandria Center for Life Science - NYC**

This offers over one million square feet of commercial laboratory space on a 3.5-acre City-owned site, the Alexandria Center for Life Science, a home for world-class pharmaceutical and biotech firms.

- **Harlem Biospace**

Harlem Biospace is a new biotech incubator in Harlem that provides up to 24 competitively-selected, early-stage life science companies access to affordable wet lab, microbench space, specialized laboratory equipment, mentorship, business support, and programming.

- **BioBAT at Brooklyn Army Terminal**

BioBAT offers 500,000 square feet of commercial lab and manufacturing space for expanding and mature life sciences firms, located in Sunset Park, Brooklyn.

- **BioLabs@NYULangone**

NYU Langone offers a 50,000 square foot biotech co-working facility providing flexible wet-lab bench rental, collaborative space, research equipment, business support and acceleration programming for early-stage life sciences companies, located in Hudson Square in Lower Manhattan. NYU Langone invested $8 million to renovate BioLabs and received a $5 million grant from NYC and $2 million from the NYS governments. It will house over 35 companies and 160 scientists, business, and support staff. Among the nearly two dozen early-stage companies currently housed at BioLabs@NYULangone are precision oncology medicine company Black Diamond Therapeutics and pharmaceutical company Sparian Biosciences, which is developing novel, safe analgesics. Another participant is microbiome biotechnology startup Fitbiomics, where researchers are studying gut bacteria from elite athletes to unlock the key to athletic performance.

- **SUNY Downstate Medical Center Biotechnology Incubator**

This is a commercial bioscience R&D facility with wet lab and office space, and access to Downstate State University of New York resources, located in Central Brooklyn. It has shifted its focus towards the pandemic. This facility has made great breakthroughs, specifically developing a lung fibrosis assay that can help developers of COVID-19 drugs predict how effective their materials are.

- **JLABS @ NYC**

JLABS is a Johnson & Johnson and the New York Genome Center-sponsored 30,000 square-foot facility for life science startups focused on biotech, pharmaceuticals, medical devices, and consumer health, located in SoHo in Lower Manhattan. JLABS provides early-stage companies with the unique resources and support needed to accelerate innovation of biotech, pharmaceutical, medical devices, and consumer health solutions. As of June 19, 2019, JLABS hosted a total of 35 resident companies focused on healthcare-related R&D. Of the 35 companies, 22% were medical device companies and 35% of total residents were pharmaceutical-related companies. JLABS received a $17M grant from the NYCEDC by way of the LifeSci Initiative.

- **IndieBio NY**

IndieBio offers a competitive four month program to 15 early-stage biology companies each year. Iif admitted, one will be awarded “$250,000 in seed funding, lab and co-working space, dedicated mentorship, and become part of a huge network of IndieBio alumni, investors, biotech entrepreneurs, investors, press, corporate partners, and more.

Appendix II: Post-Arrival NYC LSH Resources for Dutch Companies

- **Entrepreneurship Lab NYC**

This Program features a mini-MBA curriculum, expert coaching, pitch preparation support, team building activities, and access to a community of seasoned entrepreneurs, investors and mentors. Intensive training & mentorship program for early-career scientists and post doctorates starting new ventures from NYC-based academic medical centers.

- **Small Business Innovation Research (SBIR) Impact NYC**

A competitive one-on-one SBIR/STTR application assistance program for life sciences and healthcare technology ventures based in New York City. The program awards 20 hrs. of one-on-one assistance to each of 20 select companies actively preparing SBIR/STTR proposals.

- **LifeSci NYC Internship Program**

A paid summer internship program for undergraduate and graduate students interested in pursuing careers in the life sciences. Apply for LifeSci NYC Internship Program

- **Digital Health Breakthrough Network**

The Digital Health Breakthrough Network offers rapid validation for early-stage health tech startups by enabling them to collaborate with NYC-based healthcare providers quickly and affordably.

- **Digital Health Marketplace**

Digital Health Marketplace encourages commercialization of new digital health technologies through curated matchmaking of buyers and sellers of market-ready health technologies, technical assistance, and competitive funding for pre-sale pilot projects.

Appendix III: Most Active VC Investors in NYC Healthcare

MOST ACTIVE

Investors in NYC Healthcare

Investor	# NYC Investments	NYC Companies	Focus
ALEXANDRIA VENTURE INVESTMENTS	25+	Applied Therapeutics, ENB Therapeutics, Gencove, Gotham Therapeutics, Intra-Cellular Therapies, Kallyope, Lodo Therapeutics, Magnolia Neurosciences, MeiraGTx, MouSensor, Petra Pharma, Prevail Therapeutics, Quentis Therapeutics, Rgenix, X-Vax Technology, Yesse Technologies, Zentalis Pharmaceuticals	Healthcare
PARTNERSHIP for New York City	12	Celmatix, Cureatr, EpiBone, Intra-Cellular Therapies, Lodo Therapeutics, Magnolia Neurosciences, Petra Pharma, Rgenix, Spring Health, TARA, Vivaldi Biosciences, Wellth	Multiple industries
DEERFIELD Advancing Healthcare	9	Axon Therapies, Cureatr, Dracen Pharmaceuticals, NYC Digital Health Fund, Quartet Health, Schrodinger, Sermo, Stelexis Therapeutics, Vesta Healthcare (formerly Hometeam)	Healthcare
PRIMARY VENTURE PARTNERS	9	Alma, CredSimple, Flume Health, Healthify, HLTH, K Health, Kinetic, Noom, Stellar Health	Multiple industries
BOX GROUP	9	Alma, Blink Health, Hero, K Health, Level, Maven, One Drop, Oscar, Ro	Multiple industries
GREYCROFT	8	Candid, Eden Health, Ever/Body, HealthReveal, Medly Pharmacy, Thirty Madison, Thrive Global, Vault Health	Multiple industries
polarispartners	8	Kallyope, Nomad Health, Phreesia, Quartet Health, Quentis Therapeutics, Remedy Health Media, US Healthvest, Wellthy	Multiple industries
RRE Ventures	7	Care/Of, Kaleidoscope Labs, Kindbody, Nomad Health, Noom, One Drop, Spring Health	Multiple industries
G/	7	Imagen Technologies, Kindbody, Oscar, Owkin, Quartet Health, Schrodinger, Verana Health	Multiple industries
OAK HC/FT	6	Galileo, Maven Health, Quartet Health, Unite Us, US Healthvest, Vesta Healthcare (formerly Hometeam)	Multiple industries
FJ LABS	6	Mavencare, One Drop, Paloma Health, Parsley Health, Torch Technology, Wellthy	Multiple industries

Investor	# NYC Investments	NYC Companies	Focus
F/PRIME	6	Centivo, Meves Pharmaceuticals, Owkin, Quartet Health, Turnstone Biologics, US Healthvest	Multiple industries
First Round	6	Alma, Caredox, Level, Nomad Health, Simplifeye, Truveris	Multiple industries
LERER HIPPEAU	6	Heartbeat Health, K Health, Klara, Medly Pharmacy, Oscar, Thrive Global	Multiple industries
Oxeon	5	Capsule, Centivo, Cityblock Health, Risalto, Tend	Healthcare
Redmile Group	5	Hookipa Pharma, Neurogene, Nuvation Bio, Zentalis Pharmaceuticals	Healthcare
THRIVE CAPITAL	5	Capsule, Cedar, Cityblock Health, Oscar Health, Rightway Healthcare	Multiple industries
FOUNDERS FUND	5	Cedar, Oscar Health, Roivant Sciences, X-Vax Technology, ZocDoc	Multiple industries
3K	5	Dadi, Envisagenics, Gencove, Hero, Redesign Science	Multiple industries
FIRSTMARK	5	BioDigital, Klara, Parsley Health, Phosphorus Diagnostics, Ro	Multiple industries
LUX+	5	Kallyope, Pager, Variant Bio, Vesta Healthcare (formerly Hometeam), Zipdrug	Multiple industries
echo	5	Abacus Insights, Cityblock Health, Phreesia, Quartet Health, Tyto Care	Healthcare
RTW Investments	5	Attune Pharmaceuticals, Immunovant, Relmada Therapeutics, Rocket Pharmaceuticals, Roivant Sciences	Healthcare
VERSANT ventures	4	BlueRock Therapeutics, Gotham Therapeutics, Quentis Therapeutics, Turnstone Biologics	Healthcare
BESSEMER VENTURE PARTNERS	4	Candid, Centivo, K Health, Torch Technology	Multiple industries
town hall ventures	4	Aetion, Cityblock Health, Torch Technology, Unite Us	Healthcare
OrbiMed	4	Meves Pharmaceuticals, Prevail Therapeutics, SmartZyme Biopharma, Turnstone Biologics	Healthcare

Appendix IV: List of NY Venture Capital Firms Advancing eHealth

Appendix V: List of Largest Medical Supply Distributors in New York

Appendix VI: List of the Largest Healthcare Systems in New York

Appendix VII: List of the Largest Hospitals in New York

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