



Special Initiative for Rebuilding and Resiliency

New York City Healthcare Findings

A Stronger More Resilient New York

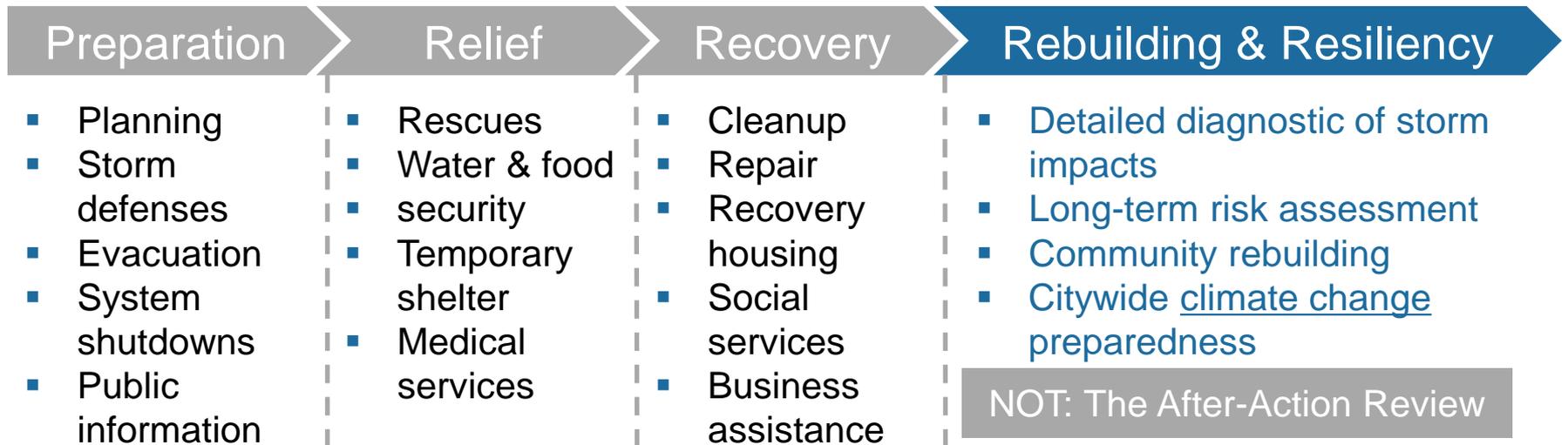
<http://www.nyc.gov/html/sirr/html/report/report.shtml>

June 2013

Agenda

- **Overview NYC Special Initiative for Rebuilding and Resiliency**
 - **Healthcare objectives and process**
- What Happened During Sandy and Why in NYC?
- What Could Happen in the Future in NYC?
- What do we recommend to do to address the future risk?
 - New York City recommends
 - Additional ideas for New York to consider
- Discussion / Q&A

Special Initiative for Rebuilding and Resiliency (SIRR) is part of New York City's response to Sandy



Examples (Partial List Only)

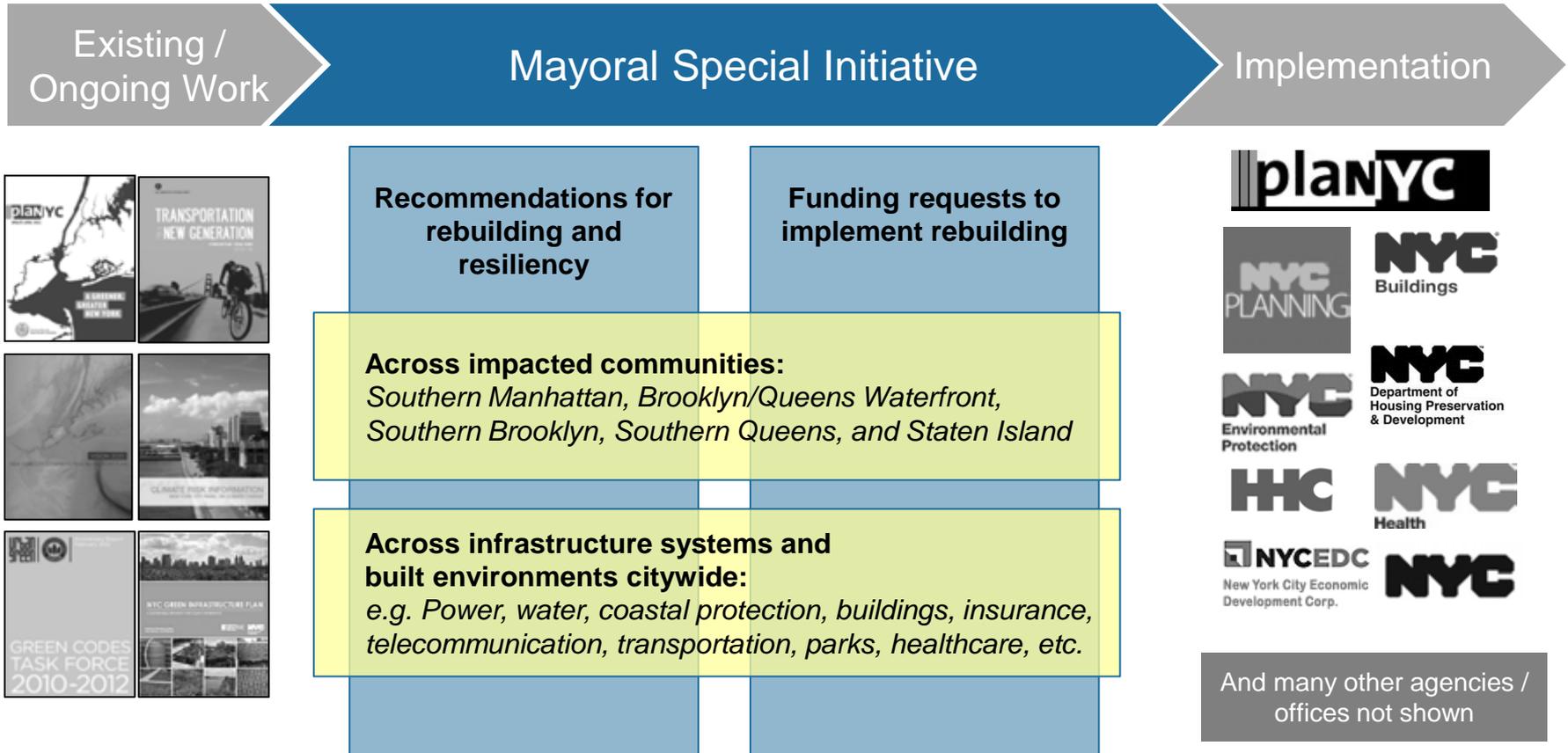


SIRR is focused on long-term rebuilding and resiliency
 “Being prepared for future events”

Mayor Bloomberg set up special initiative (“SIRR”) in Dec 2012 to answer three key questions in 6 months...

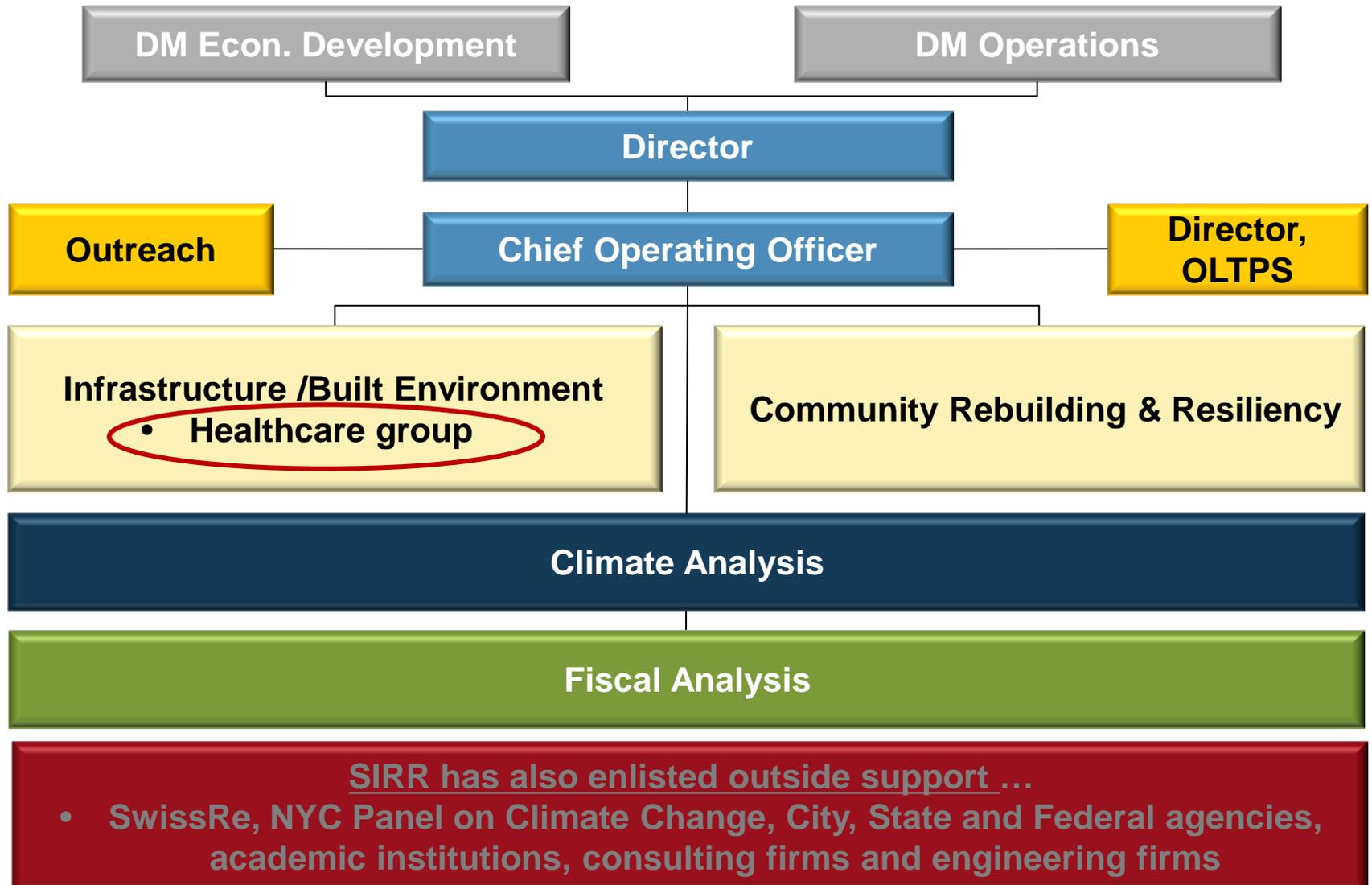


... And delivered 250+ recommendations in “A Stronger, More Resilient New York” which was announced on June 11

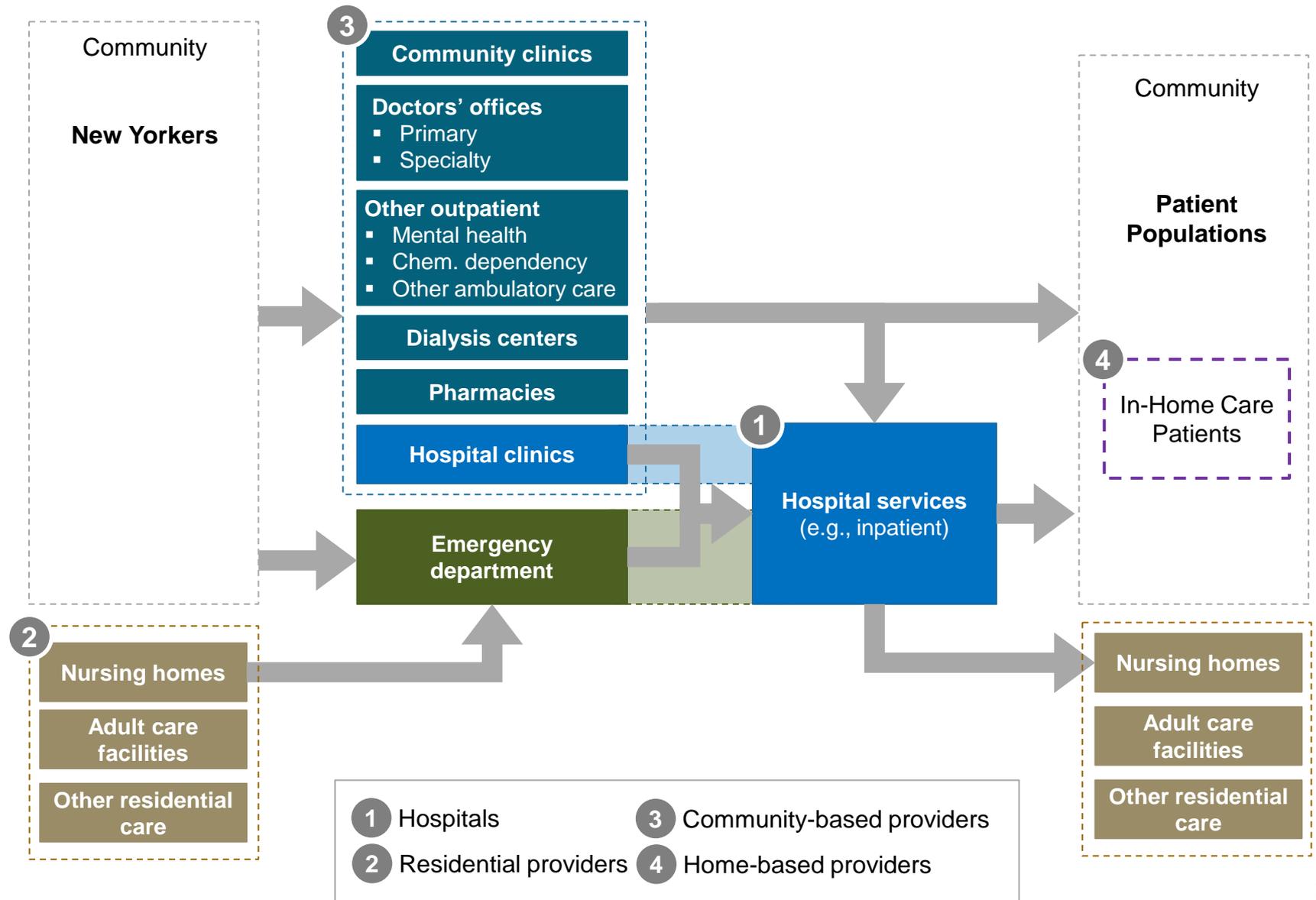


SIRR's 250+ initiatives will be implemented by city agencies over multiple years, subject to available funding

To answer these questions, NYC put together a team of 35+ professionals supported by a wide array of internal and external resources



SIRR's healthcare group was asked to answer these three key questions for healthcare providers taking into account the interconnected nature



To answer these questions, we spent several months talking to providers and other experts as well as pressure testing options

- 1 Interviewed people on what happened (300+ people engaged; 300+ meetings)**
 - What happened to you during Sandy?
 - What systems failed or damaged?
 - How did you address system failures?
- 2 Developed initial hypothesis on what is essential based on interviews**
 - E.g., what impacts patient safety? what has operational workarounds? what is essential vs. nice to have?
- 3 Tested what is essential with providers and experts (multiple rounds)**
 - E.g., would you have to evacuate without this system? how long would have taken you to replace this system?
- 4 Identified what we can address using City tools**

Focused on what is essential to patient safety

Agenda

- Overview NYC Special Initiative for Rebuilding and Resiliency
 - Healthcare objectives and process
- **What Happened During Sandy and Why in NYC?**
- What Could Happen in the Future in NYC?
- What do we recommend to do to address the future risk?
 - New York City recommends
 - Additional ideas for New York to consider
- Discussion / Q&A

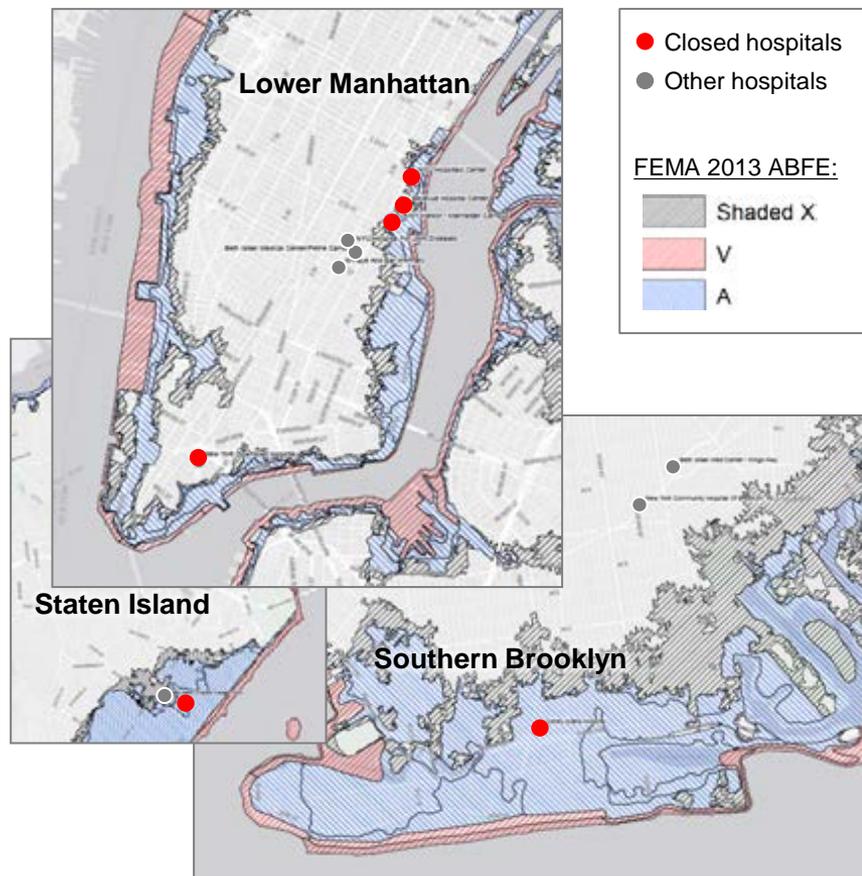
In summary, New York City's Healthcare System was impacted by Sandy

- **6 hospitals closed before, during, or after the storm**
 - 5 remained closed for extended periods
 - 10 other hospitals experienced some inundation and/or power outages
 - 8% of bed capacity was lost temporarily
- **26 nursing homes/ adult care facilities closed**
 - Another 5 partially evacuated (including one with ~1,000 beds)
 - 30 other facilities were in inundated and/or power outage areas but remained open
- **~5 % community-based providers were in inundated areas**
 - Another ~12% in power outage areas
 - Multiple day transportation shut-downs limited patients and staffs' ability to travel
 - Many providers closed during Sandy; most return to service within a week
- **Home-based providers had trouble reaching patient during transportation shut-downs or driving restrictions**

However, this summary only tells what happened not why it happened or the how it impacted patients

Six hospitals closed during Sandy and 10+ hospitals used workarounds to remain operational despite outages or some damage

6 hospitals closed (8% bed capacity)



Impact to patients—

- Patients evacuated to other hospitals; many during emergency conditions
- Elective services and surgeries reduced in many open facilities
- Reduced citywide inpatient bed-capacity

Storm impact on hospital buildings

Disruptions to electrical & other important systems prompted emergency evacuations

- Fuel tanks were breached, interrupting fuel supply to emergency power generators
- Water pumps flooded, resulting in loss of sanitation and other services requiring water supply
- Power loss caused failure of other services, including elevators, communications, and IT

Flooding of basements & first floors destroyed equipment, requiring months to repair

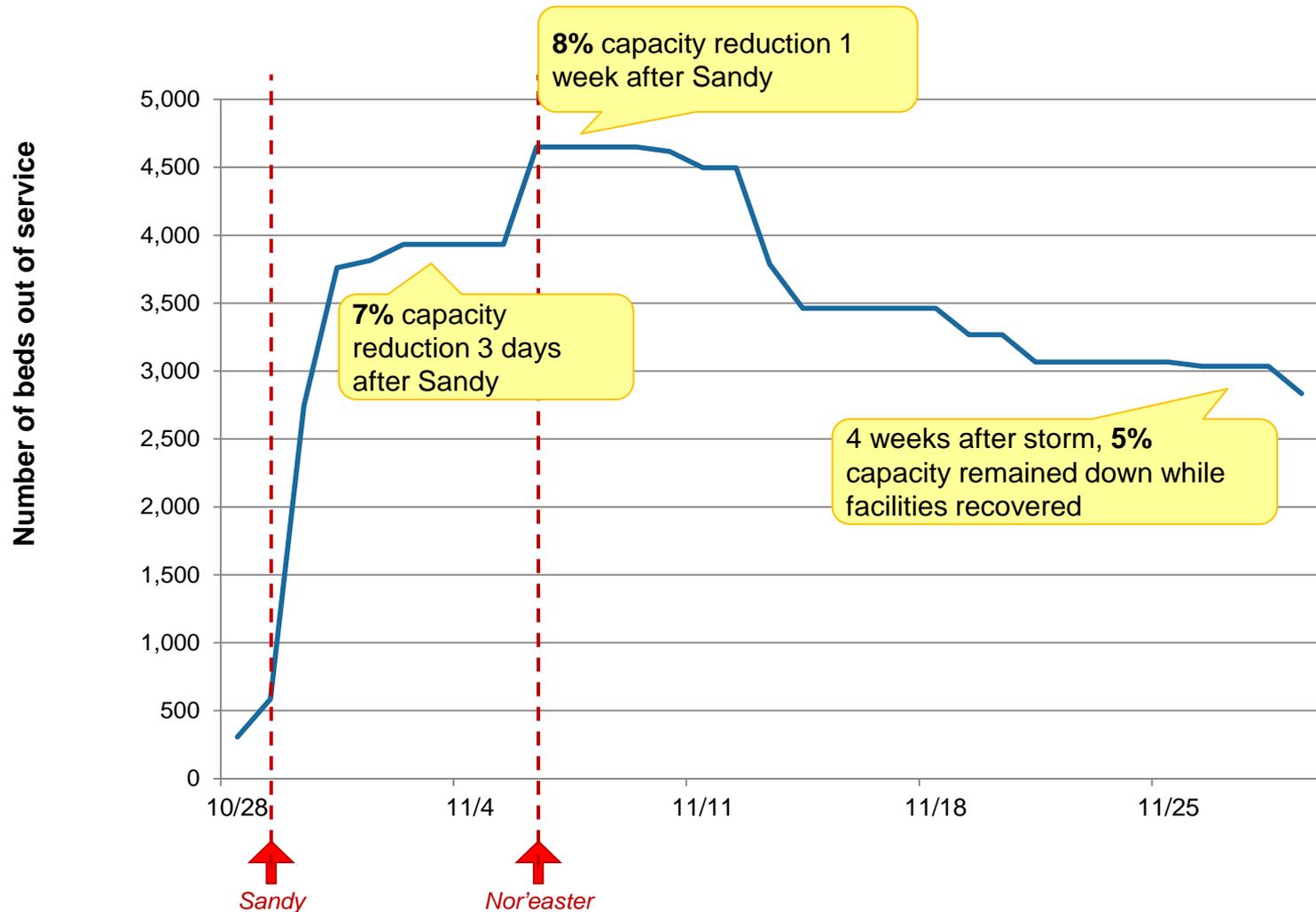
- Electrical switch gear was destroyed
- Boilers and chillers were damaged
- Walls and floors were damaged by mold

Facilities that stayed open relied on operational workarounds, including:

- Rental of temporary boilers to keep space inhabitable
- Runners for internal communication
- Cell phones and radios for external communication
- Paper charts and records if IT systems were down

26 nursing homes/adult care facilities closed, 5 partially evacuated, & 30 were in inundated or power outage areas but remained open (I)

Bed capacity lost from 31 facility



26 nursing homes/adult care facilities closed, 5 partially evacuated, & 30 were in inundated or power outage areas but remained open (II)

Storm impact on NH/ACF buildings

Failure or absence of emergency power systems required facilities to evacuate patients

- Nursing homes' generators stored on lower floors were damaged by floodwaters
- Many adult care facilities did not have generators and evacuated after extended utility outages
- Power loss caused failure of other services, including elevators, communications, and IT

Flooding destroyed lower floors – facilities could not re-occupy due to need for extensive repairs

- Electrical switch gear was destroyed
- Boiler systems were damaged
- Walls and floors were damaged by mold
- Contents of kitchens and staff offices were destroyed

Facilities that stayed open relied on operational workarounds, including:

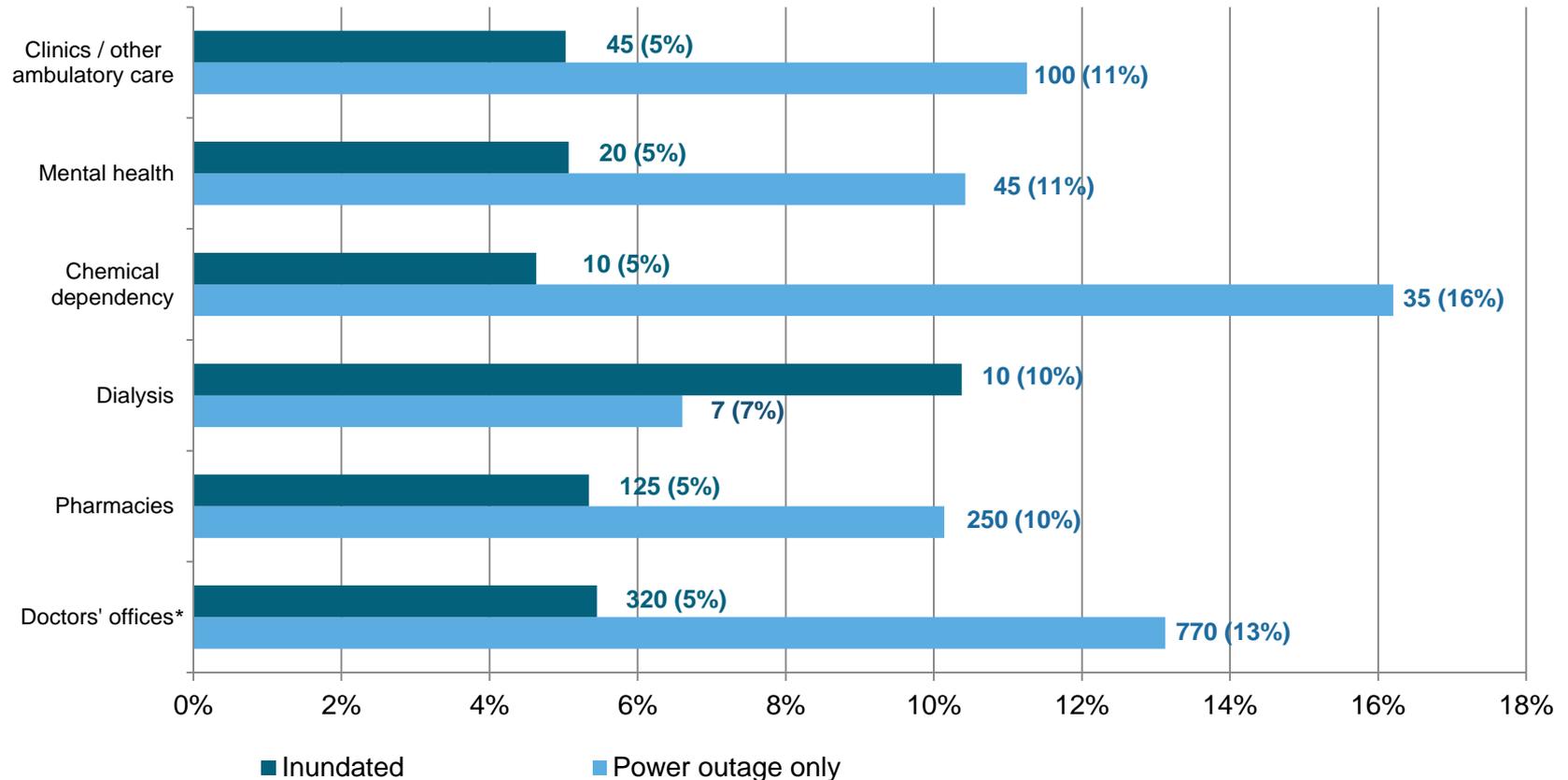
- Flashlights and battery-powered devices
- Electric heaters and blankets to keep patients warm
- Cell phones for external communication

Impact to patients—

- Patients evacuated to other facilities (including auditoriums, lobbies) or special medical needs shelters; many during emergency conditions
- Reduced citywide inpatient bed-capacity; hospital couldn't discard

Approx. 5% community-based provider locations inundated and ~12% had power outages; concentrated in certain communities (I)

~17% of community-based provider locations were impacted by inundation or power outage



*Reflects number of unique private physicians' office locations (one location may have multiple physicians). Primary care physicians include Geriatrics, Pediatrics, Adolescent Medicine, Family Practice, Internal Medicine, General Medicine, and OB/GYN

Approx. 5% community-based provider locations inundated and ~12% had power outages; concentrated in certain communities (II)

Storm impact on community-based services

Overall most providers were undamaged and undamaged facilities experience limited outages

- From none to 1 week

Limited citywide impact but significant impact in hardest hit communities, e.g.,

- ~95% lost power below 42nd street in MHTN
- ~60% in inundated areas in South Queens

Facility closures disrupted providers' ability to address patient needs (e.g. prescription refills)

- Power outages temporarily closed facilities (for 4-5 days) because few had backup generators
- Flooding caused facilities to close longer-term due to clean-up and repair efforts
- Patient calls went unanswered

Staff had trouble traveling around the city keeping some offices closed for a few days; patients had trouble traveling for appointments causing cancellations

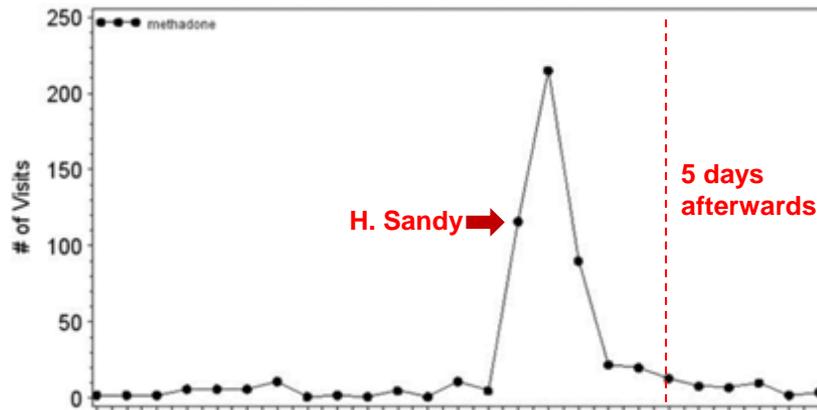
Impact to patients—

- Some patient delayed care for a few days if they could not see or speak to their normal providers (e.g., refill prescriptions)
- Some patients sought care at EDs or open providers (e.g., dialysis, methadone)

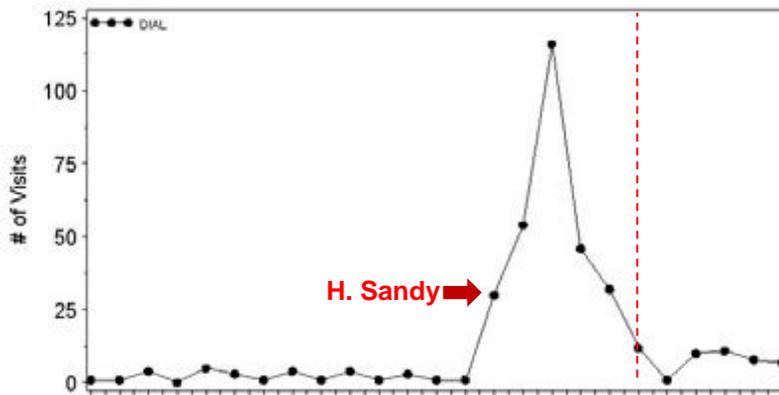
Transportation – not building damage – seems to be the root cause of the spike in ED visits for urgent needs such as methadone and dialysis

EDs experienced a spike in some needs

Methadone Syndrome ED Visits in NYC



Dialysis Needed ED Visits in NYC



Storm impact on community-based services

Overall few facilities citywide were damaged by flooding; most are located in non impacted areas

- However, damage was concentrated within a few communities

More providers experienced power outages; however, still a relatively small number compared to all facilities

- Most do not have generators; dependent on utilities
- Even if generators were available, some providers aren't able to accept generators because their wiring cannot be isolated from the larger building easily

Citywide providers found some staff had trouble traveling to work; impact to patient services varied

Some dialysis centers that opened said they were empty because patients couldn't travel to them

- Public transportation was closed
- Transportation restriction limited movement
- Gas shortages limited available vehicles
- Many private transportation companies were shut down or had reduced services

In summary, during Sandy, critical system failures – namely power failures – caused evacuations, closures, and reduced services

Providers	Impact	Building	Equipment (elevators, Imaging)	Utilities (power, water)	Heating/cooling	Communications/IT	Staff	Supplies
Hospital EDs	Closures / reduced services	Flooded	Flooded	Back-up failed	Flooded	Carrier-side outages		
Hospital in-patient / elective surgeries	Evacuations	Flooded	Flooded	Back-up failed	Flooded	Carrier-side outages	Staff couldn't travel	Limited deliveries
Nursing homes	Evacuations	Flooded	No back-up power	Back-up failed	No back-up	Phone/internet outages		
Adult care facilities	Evacuations	Flooded	No back-up power	No back-up	No back-up	Phone/internet outages		
Community-based providers	Closures / reduced services	Flooded	No back-up power	No back-up	No back-up	Phone/internet outages	Staff couldn't travel	Limited deliveries
Home-based providers	Reduced services	Disruptions in patients' homes/residences, e.g. loss of power, elevators not working				Carrier-side outages	Staff couldn't travel	Delayed deliveries

■ Primary reason for disruption
 ■ Secondary reason
 ■ Tertiary reason

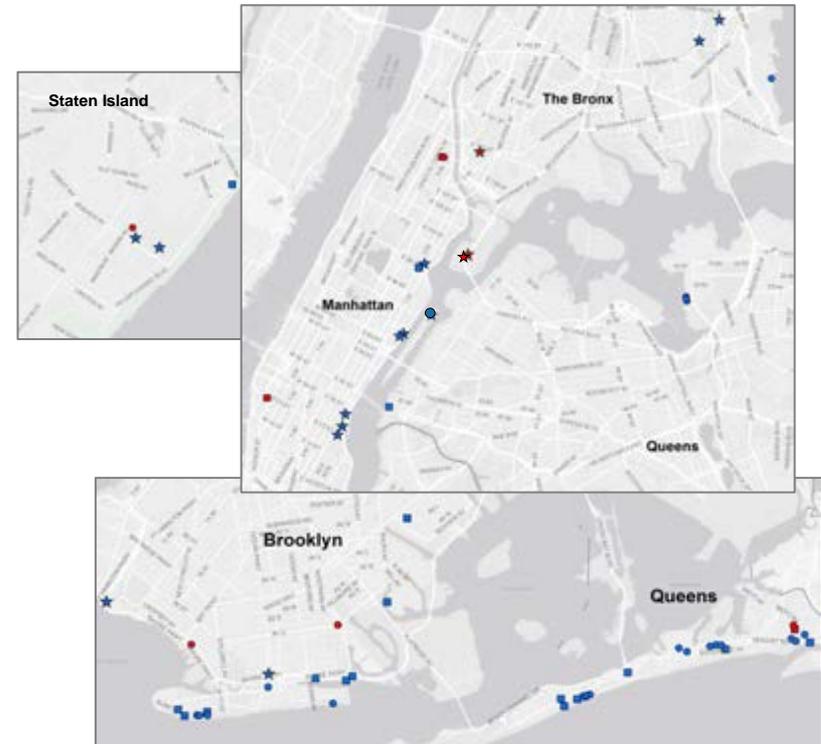
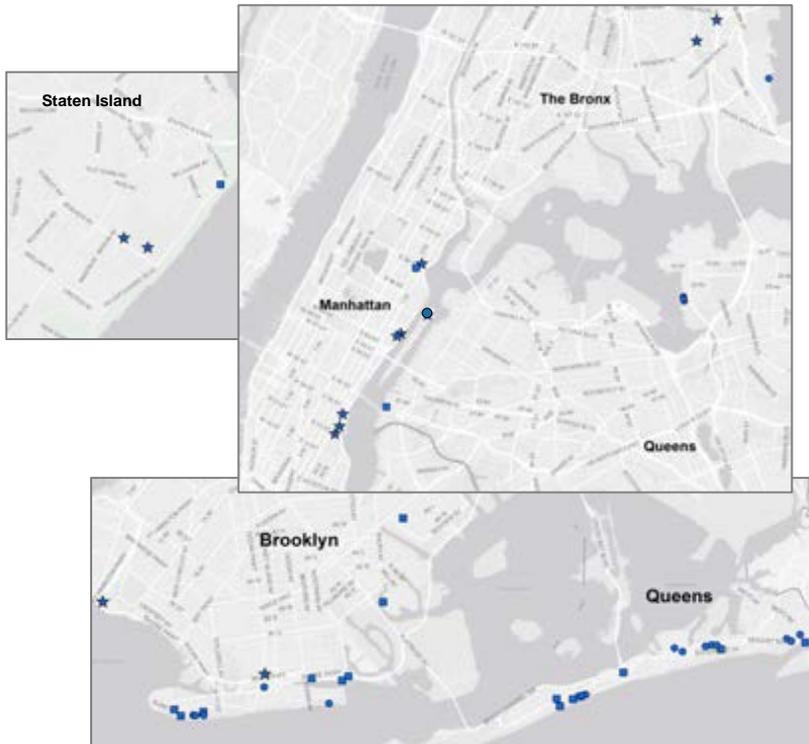
Agenda

- Overview NYC Special Initiative for Rebuilding and Resiliency
 - Healthcare objectives and process
- What Happened During Sandy and Why in NYC?
- **What Could Happen in the Future in NYC?**
- What do we recommend to do to address the future risk?
 - New York City recommends
 - Additional ideas for New York to consider
- Discussion / Q&A

Approx. 18% hospital beds are at risk today (11 facilities); additional 2 facilities are at risk by 2020

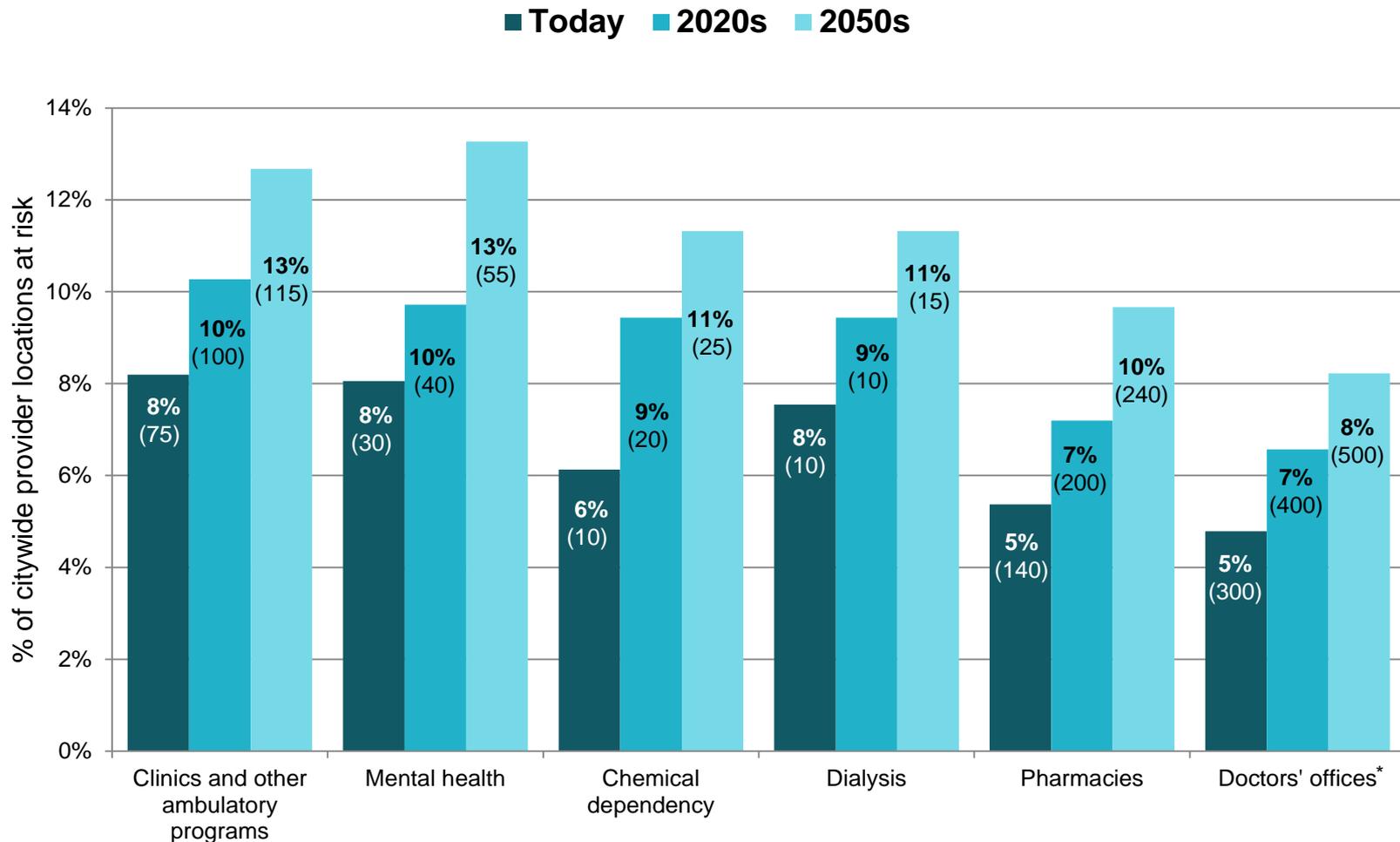
Providers	Today (PWMs 2013)	
	Number at risk*	% of total
Hospitals	11 (5,100 beds)	15% (18% of beds)
Nursing homes	18 (5,000 beds)	10% (11% of beds)
Adult care facilities	19 (2,700 beds)	27% (26% of beds)

Future (2020s DRAFT)		
Number at risk**	% of total	% vs. 2013
13 (5,700 beds)	19% (20% of beds)	+18%
23 (5,700 beds)	13% (13% of beds)	+28%
21 (2,800 beds)	30% (27% of beds)	+11%



*At-risk facilities defined as nursing homes and adult care facilities located in 100-year flood zones (1% annual chance of flood) and hospitals are counted within 500-year flood zones; ** For hospitals 500-year in 2020 used hospitals in 2050s 100-year flood zone; # based on June PWMs and map based on Feb ABFEs (1 additional ACF added; 4 NH removed citywide)

Approx. ~10% of community-based locations will be in inundated areas in 2020 and ~15% in 2050; remains concentrated in certain communities



The increasing number of facilities that could be impacted by flooding highlights the need to act; however, it doesn't indicate what to do

*Reflects number of unique private physicians' office locations (one location may have multiple physicians). Primary care physicians include Geriatrics, Pediatrics, Adolescent Medicine, Family Practice, Internal Medicine, General Medicine, and OB/GYN

To understand what to address, SIRR asked “What critical systems do hospitals need to stay open/ avoid emergency evacuations?”

	Building systems/ resources	How long can you go without it?	Estimated repair time	Are there adequate workarounds?	Outcome
Criticality	Emergency power (w/no primary)	Less than a day	Days	No	Need to evacuate
	Water (building pumps)	Less than a day	Days/ weeks	No	
	HVAC	Less than a day	Months	No	
	Elevators	Days/weeks	Weeks/months	Maybe (use stairs)	Some service disruptions (e.g. fewer admissions, selective evacuation)
	IT	Weeks/months	Weeks/months	Yes (use paper records / other workarounds)	
	Communications	Weeks/months	Weeks/months	Yes (use runners / other workarounds)	
	Primary power (w/working back-up)	Weeks/months	Weeks/months	Yes (Bring in external generator for additional power)	
	Building (space used for care)	Weeks/months	Weeks/months	Yes (re-assign patient care areas)	
	Labs/ equipment	Months	Months	Yes (use temp space/equipment or external providers)	
	Oxygen/ medical gases	Months	Months	Yes (use portable tanks)	Minimal impact to patients
	Supplies	-	-	Yes (rely on back-up supplies and secondary suppliers)	

Potential gaps for city mitigation

Source: SIRR interviews

Note: **Fuel** and **staff** are also critical to operate continuously. Citywide fuel supply and transportation issues being examined separately since it impacts more than healthcare.

To understand what to address, SIRR asked “What critical systems do nursing homes need to stay open/ avoid emergency evacuations?”

Building systems/ resources	How long can you go without it?	Estimated repair time	Are there adequate workarounds?	Outcome	
Criticality	Emergency power (w/ no primary)	Less than a day	Days	No	Need to evacuate
	Water	Less than a day	Days	No	
HVAC	Days	Months	Maybe (depends on climate; can use electric heaters/fans or hook up temp boilers chillers)	Maybe evacuate	
Primary power (w/ working back-up)	Days/weeks	Months	Maybe (backup may fail with extended usager)		
Building (space used for care)	Days/weeks	Months	Maybe (depends on extent of damage; can house patients in closer spaces)		
IT	Months	Weeks/months	Yes (use paper records / other workarounds)	Some service disruptions	
Communications	Months	Weeks/months	Yes (use cell phones/ other workarounds)		
Oxygen/ medical gases	Months	2+ weeks (building systems)	Yes (use portable tanks)	Minimal impact to patients	
Supplies	-	-	Yes (rely on back-up supplies and secondary suppliers)		

Potential gaps for city mitigation

Source: SIRR interviews

Note: **Fuel** and **staff** are also critical to operate continuously. Citywide fuel supply and transportation issues being examined separately since it impacts more than healthcare.

To understand what to address, SIRR asked “What critical systems do adult care facilities need to stay open/ avoid emergency evacuations?”

Building systems/ resources	How long can you go without it?	Estimated repair time	Are there adequate workarounds?	Outcome	
Criticality	Power	Days	Weeks/months	Maybe (depends on climate, use flashlights/glowsticks or bring in external generator)	Maybe evacuate
	Water	Days	Days/weeks	Maybe (24-48 hrs to truck in water)	
	HVAC	Days/weeks	Weeks/months	Maybe (depends on climate; can use electric heaters/fans or hook up temp boilers/chillers)	
	Building (space used for care)	Days/weeks	Months	Maybe (depends on extent of damage; can house patients in closer spaces)	
IT	Months	Weeks/months	Yes (use paper records / other workarounds)	Some service disruptions	
Communications	Months	Weeks/months	Yes (use cell phones/ other workarounds)		
Supplies	-	-	Yes (rely on back-up supplies and secondary suppliers)	Minimal impact to patients	

Important note: extensive emergency operations planning for both local and regional incidents is required to be able to leverage adequate workarounds

Potential gaps for city mitigation

Source: SIRR interviews

Note: **Fuel** and **staff** are also critical to operate continuously. Citywide fuel supply and transportation are not in scope of healthcare infrastructure and will be addressed separately.

To understand what to address, SIRR asked “What critical systems do clinics need to address patients’ needs?”

Building systems/ resources	How quickly do you want to restore it?	Estimated repair time in case of outage	What do you need this system to do?	Level of service if restored
Communications	A day	Days/months	Answer calls from patients	Patients can communicate with providers
IT	Few Days	Days/months	Access patient health records, insurer records	In-person care (scope of treatment limited to urgent/chronic concerns, prescriptions)
Staff	Few Days	Days	Operate facility	
Building	Few Days	Weeks/months	Space for patients	
Power	Few Days	Days/months	Run telecom, IT, lights, water, HVAC	
Water	Few Days	Days/weeks	Sanitation, run equipment	
Supplies	Few Days	Days	Diagnosis and treatment	
Equipment	A week	Weeks	Diagnosis and treatments requiring specific equipment	Normal services
HVAC	A week	Weeks/months	Create comfortable environment	

Criticality

Potential gaps for citywide mitigation

Potential gaps for city mitigation in areas at risk of flooding

To understand what to address, SIRR asked “What critical systems do home-based care providers need to address patients’ needs?”

Building systems/ resources	How quickly do you want to restore it?	Estimated repair time in case of outage	What are potential solutions to address?	Level of service if restored
Communications/ IT	Less than a day	Days	Remote phone services and electronic health records	Patients can communicate with providers
Staff	A Day	Days	Alternate travel plans for staff	In-person care (limited population / scope)
Supplies	Days	Days	Store backup; use local pick-up stations for special orders	
Utilities and other systems	Days/weeks	Days/weeks/months	Rely on building systems / utilities to recover in patients’ homes	Normal services

Criticality

Agenda

- Overview NYC Special Initiative for Rebuilding and Resiliency
 - Healthcare objectives and process
- What Happened During Sandy and Why in NYC?
- What Could Happen in the Future in NYC?
- **What do we recommend to do to address the future risk?**
 - **New York City recommends**
 - Additional ideas for New York to consider
- Discussion / Q&A

SIRR's recommendations seek to address four important goals for the citywide healthcare system during extreme weather events

- 1 Reduce the risk of emergency evacuations**
- 2 Be able to take on acute emergent patient needs (during and after an event)**
- 3 Avoid extended facility outages that strain the system**
- 4 Reduce how many patients cannot access their normal provider**

To address these citywide goals, SIRR identified two key strategies

Minimize disruptions in the **healthcare system** in order to preserve the wellbeing and health of all New Yorkers

=

Operate continuously

or

Re-open quickly

Key strategies

- A** Ensure critical healthcare providers' operability through redundancy and the prevention of physical damage
- B** Reduce barriers to care during and after emergencies

For new healthcare facilities in floodplain, the City seeks to change the Construction Code to avoid emergency evacuation and long-term closures

System criticality	Building systems	Evacuation risk	Strategies	Mitigation solutions	Providers		
					H	NH	ACF
	All systems		Improve the long-term resiliency of flood mitigation in facilities	<ul style="list-style-type: none"> Require mitigation to the 500-year flood elevation 	✓		
	Emergency power (w/no primary)	High (within a day)	Minimize the likelihood of emergency evacuations by ensuring a <u>continuous supply of emergency power</u>	<ul style="list-style-type: none"> Require generators/equipment to be elevated or protected Require fuel tanks and ancillary equipment to be protected Require installation of flood-resistant emergency generator and fuel supply, or pre-connections for external generators Require generators and fuel pumps to be always accessible 	✓	✓	
			Ensure <u>power redundancy</u> when running on emergency power to avoid emergency evacuation	<ul style="list-style-type: none"> Require pre-connections for external emergency generators 	✓	✓	
	Water	High (within a day)	Ensure <u>building-level water supply is not compromised</u> to avoid emergency evacuation (e.g., if loss of sanitation)	<ul style="list-style-type: none"> Require electrically-powered domestic water pumps to be elevated or protected (if applicable) 	✓	✓	✓
	HVAC	High (within a day)	Avoid emergency evacuations due to buildings being <u>over- or under-heated</u>	<ul style="list-style-type: none"> Require boilers and chillers to be elevated or protected Require pre-connections for temporary boilers and chillers if primary equipment is located below DFE Require HVAC for in-patient units to be operational during power utility outage (e.g. installing extra generator capacity) 	✓	✓	✓
	Primary power (w/ back-up)	Moderate (depends on damage)	Prevent long-term closures due to <u>permanent damage</u> (decrease patient access to care)	<ul style="list-style-type: none"> Require electrical switch gear to be elevated or protected 	✓	✓	✓
	Building (space used for care)	Moderate (depends on damage)	Prevent water from entering lower floors	<ul style="list-style-type: none"> Require lowest level to be elevated above DFE or lower levels below DFE to be dry flood-proofed 	✓	✓	
<ul style="list-style-type: none"> Require lowest level to be elevated above DFE 						✓	
	Other building services	Low	Prevent reduction in patient care services due to loss of equipment	<ul style="list-style-type: none"> Require equipment to be elevated or protected, e.g.: <ul style="list-style-type: none"> Elevators IT and Communications rooms/ equipment Labs and imaging equipment (if applicable) Medical gas tanks (if applicable) 	✓	✓	✓

Hospital retrofits focus on a set of critical systems that could cause emergency evacuations (Applies to those in 500-year floodplain by 2030)

Building systems/ resources	Evacuation risk	Strategies	Mitigation solutions
Emergency power (w/no primary)	High (within a day)	Minimize the likelihood of emergency evacuations by ensuring that hospitals have a <u>continuous supply of emergency power</u>	<ul style="list-style-type: none"> Require elevation or hardening of generators/equipment Require protection of fuel tanks and ancillary equipment Require generators and fuel pumps to be always accessible
		Ensure hospitals have <u>power redundancy</u> when running on emergency power to avoid emergency evacuation	<ul style="list-style-type: none"> Require pre-connections for external emergency generators
Water	High (within a day)	Ensure <u>building-level water supply is not compromised</u> to avoid emergency evacuation (e.g., no sanitation)	<ul style="list-style-type: none"> Require elevation or hardening of domestic water pumps
HVAC	High (within a day)	Avoid emergency evacuations due to buildings being <u>over- or under-heated</u>	<ul style="list-style-type: none"> Require pre-connections for temporary boilers and chillers if primary equipment is located below DFE Require HVAC for in-patient units to be operational during power utility outage (e.g. installing extra generator capacity)
Primary power (w/ working back-up)	Moderate (depends on damage)	Prevent long-term closures due to <u>permanent damage</u> (decrease patient access to care)	<ul style="list-style-type: none"> Require elevation or protection electrical switch gear
Building (space used for care)	Moderate (depends on damage)	Prevent water from entering lower floors	<ul style="list-style-type: none"> Consider use of flood barriers (feasibility will vary by facility)
Elevators	--	Assess needs individually for each facility – some can leverage operational workarounds, e.g.: <ul style="list-style-type: none"> Stairs Paper charts Runners, cell phones Rental equipment or external providers Portable gas tanks 	
IT			
Communications			
Labs/ equipment			
Medical gases			

System criticality

Nursing home retrofits focus on critical systems that could cause emergency evacuations (Applies to those in 100-year floodplain by 2030)

Building systems/ resources	Evacuation risk	Strategies	Mitigation solutions
Emergency power (w/no primary)	High (within a day)	Minimize the likelihood of emergency evacuations by ensuring that nursing homes have a <u>continuous supply of emergency power</u>	<ul style="list-style-type: none"> • Require elevation or hardening of generators and essential equipment • Require protection of fuel tanks and ancillary equipment
Water	High (within a day)	Ensure <u>building-level water supply is not compromised</u> to avoid emergency evacuation (e.g., no sanitation)	<ul style="list-style-type: none"> • Require elevation or hardening of domestic water pumps, or an equivalent plan to distribute water to the building
Primary power (w/ working back-up)	Moderate (depends on damage)	Prevent long-term closures due to <u>permanent damage</u> (avoid system strain from long-term housing extra patients in none damaged NH)	<ul style="list-style-type: none"> • Require elevation or protection electrical switch gear
HVAC	Moderate (depends on climate)	Avoid evacuations due to facilities being overheated	<ul style="list-style-type: none"> • Encourage installation of emergency generator capacity for in-patient units' HVAC
Building (space used for care)	Moderate (depends on damage)	Limit extended closures due to interior damage from floodwaters	<ul style="list-style-type: none"> • Encourage use of mold-resistant materials
Elevators	--	Assess needs individually for each facility – some can leverage operational workarounds, e.g.: <ul style="list-style-type: none"> • Stairs • Paper charts • Staff cell phones • Rental equipment or external providers 	
IT			
Communications			
Medical gases			

System criticality

Adult care facility retrofits focus on critical systems that could cause emergency evacuations (Applies to those in 100-year floodplain by 2030)

Building systems/ resources	Evacuation risk	Strategies	Mitigation solutions
Emergency power (w/no primary)	High (within a day)	Minimize the likelihood of emergency evacuations by ensuring that adult care facilities <u>have emergency power</u>	<ul style="list-style-type: none"> Require installation of emergency generators and fuel tanks or pre-connections for external generators
Primary power (w/ working back-up)	Moderate (depends on damage)	Prevent long-term closures due to <u>permanent damage</u> (avoid system strain from long-term housing extra patients in none damaged ACF)	<ul style="list-style-type: none"> Require elevation or protection electrical switch gear
HVAC	Moderate (depends on climate)	Avoid evacuations due to facilities being overheated	<ul style="list-style-type: none"> Encourage installation of emergency generator capacity for in-patient units' HVAC
Water	Moderate (depends on emergency operations)	Ensure building-level water supply is not compromised	<ul style="list-style-type: none"> In buildings using electrically-powered pumps, encourage elevation or hardening of pumps or planning for operational workarounds
Building (space used for care)	Moderate (depends on damage)	Limit extended closures due to interior damage from floodwaters	<ul style="list-style-type: none"> Encourage use of mold-resistant materials
Elevators	--	Assess needs individually for each facility – some can leverage operational workarounds, e.g.: <ul style="list-style-type: none"> Stairs Paper charts Staff cell phones 	
IT			
Communications			

System criticality

In addition to Construction Code changes, the City will seek to improve post-disaster patient care via targeted mitigation and education

- **Harden a limited number of primary care/ mental health centers in communities highly vulnerable to flooding and likely to have limited access to healthcare**
 - To address the concentrated outages in community-based providers
 - Will be competitive grant/ loan program (subject to available funding)
- **DOHMH will work with pharmacies to increase power resiliency**
 - E.g., Identify and address issues related to generators
- **Educate community-based providers on telecom and electronic record resiliency**
 - Provide information on how community-based providers can increase resiliency
 - E.g., questions they should asking their vendors

Agenda

- Overview NYC Special Initiative for Rebuilding and Resiliency
 - Healthcare objectives and process
- What Happened During Sandy and Why in NYC?
- What Could Happen in the Future in NYC?
- **What do we recommend to do to address the future risk?**
 - New York City recommends
 - **Additional ideas for New York to consider**
- Discussion / Q&A

Most NYC recommendations are applicable throughout the State; additional recommendations may be appropriate given differing conditions

Increased likelihood of power outages due to overhead radial power lines

- New York City has many of its power lines underground in a grid format
- Radial overhead power lines are more likely to be impacted by winds from storms
- Less redundancy per individual customer in a radial system

River flooding is distinctly different than storm surge flooding

- New York City faces limited risk to river flooding outside storm surge
- River flooding can last for days rather than hours

Local communities' emergency response and healthcare capabilities and resources

- E.g., where can providers evacuate to? what resources are available to use? what are the local community needs for providers to remain open?

Building size and type varies significantly

- Building size and type determines both the risks providers faces as well as possible solutions
- E.g., elevating only critical systems in a 1-story building that could experience 10 ft. of flooding is less effective than same action in a 20-story building

Utility outage risks vary by community (e.g., water, power, steam, heating fuel)

- Likelihood of outages or time to repair varies based on local utility resiliency
- Beside power and water, the importance of other utilities varies based on local usage

In addition, NY should consider issues identified during the City's process but that fall outside either SIRR's scope or the City's mandate

Emergency response planning makes all the difference; no new construction codes will eliminate the need for emergency response planning

- Utilities outages at the building or system level can occur
- Transportation disruptions can occur (e.g., road or public transportation)
- Some risks aren't related to buildings (e.g., supplier and fuel delivery delays)

Emergency response planning for a single provider incident and a regional incident is different

- Resources available for use vary significantly (e.g., generators, ambulances, supplies)
- Regional incidents can isolate providers for extended periods (e.g., multiple days)
- Transportation disruption can be significant in regional incidents (e.g., staff movement limited)

Crisis management capabilities are just as important since incidents will not happen as planned

Important for providers to know pre-evacuations vs. sheltering-in-place expectations

- E.g., minimum emergency response capabilities, minimum building resiliency standards, flood risk

Different providers with different roles/functions in the healthcare system should be treated differently when it comes to criteria such as how fast providers should be able to reopen

Important to consider how restrictions on whether various providers can build within flood zone will impact daily care in communities that are located within a flood zone

- E.g., Should nursing homes and community clinics face the same building restrictions?

Agenda

- Overview NYC Special Initiative for Rebuilding and Resiliency
 - Healthcare objectives and process
- What Happened During Sandy and Why in NYC?
- What Could Happen in the Future in NYC?
- What do we recommend to do to address the future risk?
 - New York City recommends
 - Additional ideas for New York to consider
- **Discussion / Q&A**

For new information please checkout :

<http://www.nyc.gov/html/sirr/html/report/report.shtml>

**A Stronger More Resilient New York
Mayor Bloomberg
PLAN NYC**