

Pandemic Planning: Focus on Emerging Pathogens

UNC Health
Brooke Brewer, BSN, RN, MS, CIC
Program Manager, Special Pathogens Response Center (SPARC)
Region IV Regional Emerging Special Pathogen Treatment Center

UNC HEALTH

October 30, 2023

1

Definitions

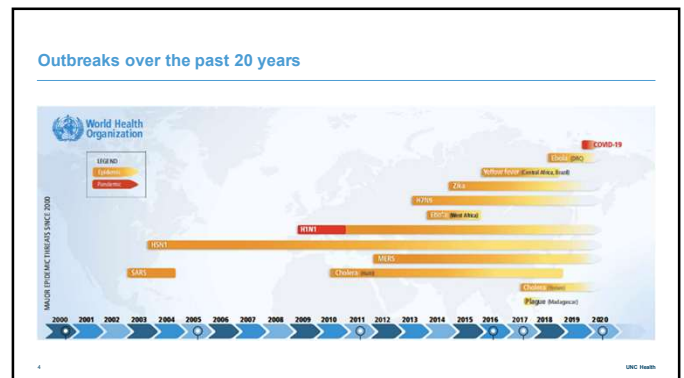
- Emerging Disease: diseases that have newly appeared in the population, OR have existed but are rapidly increasing in incidence or geographic range
- Re-emerging Disease: diseases that were once a major health problem, declined dramatically, but are again becoming health problems
- Endemic: a "long-term" problem, never significantly declining (e.g., pneumonia)
- Epidemic: an increase in disease incidence over baseline
- Pandemic: Epidemic involving >2 continents (e.g., COVID-19, MPOX)

2

Basic Concepts in Infectious Disease Emergence

- Emergence of infectious disease is complex
- Diseases are dynamic, changing
- Most new infections are not caused by completely new pathogens (e.g., coronaviruses, influenzas)
- Agents involved in new and reemerging infections cross taxonomic lines (e.g., bats and Ebola Virus Disease, fleas and plague)
- Human behavior drives disease emergence
 - Social, economic, political, technologic, climatic, and environmental factors all shape disease patterns and influence emergence

3



4

WHO Pandemic Threats – Priority Diseases

New in 2024

- Priority pathogens based on regions in the world
- WHO document: Pathogens Prioritization: A Scientific Framework for Epidemic and Pandemic Research Preparedness
- No long lists just the top 9 priority pathogens
- Determines a threat based on regions in the world
- Determines if a pathogen is a priority based on the risk of it becoming a Public Health Emergency of International Concern (PHEIC)

WHO evidence elements to assess a pathogen's potential to cause a PHEIC or pandemic

Family	Priority Pathogens 2017	Priority Pathogens 2024	PHEIC risk	Priority Pathogens	Prototype Pathogens
Adenoviridae			Low-Medium		Reovirus
Adenoviridae			Low-Medium		Rotavirus
Adenoviridae			Low		Poliovirus
Adenoviridae			High		Marburgvirus
Adenoviridae			High		Ebola virus
Adenoviridae			High		Measles virus
Adenoviridae			High		Poliovirus
Adenoviridae			High		Marburgvirus
Adenoviridae			High		Ebola virus
Adenoviridae			High		Measles virus

5



6

7

8

9

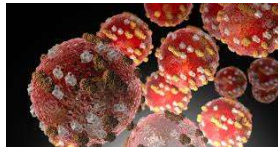
10

11

12

A fourth consideration: effective medical countermeasures

- **Immunizations (prevent it)**
- **Therapeutics (treat it)**
- **Example: Measles**
 - One of the most communicable diseases known
 - R_0 12-18
 - Highly hazardous
 - Over 136,000 worldwide deaths in 2022
 - Highly infectious
 - 0.2 organisms by intranasal spray (lab setting)
 - Medical countermeasure: immunizations
 - 75% decrease in mortality since the turn of the century
 - Does not require biocontainment level care, but only airborne precautions



UNC Health

13

KEY CONSIDERATIONS IN ASSESSING AND MANAGING THE THREAT OF AN EMERGING INFECTIOUS DISEASE

Pathogen

- Taxonomy (provides clues regarding transmission routes, environmental stability, germicide susceptibility)

- Hosts

Epidemiology

- Locations of endemicity (i.e., locations in the world where sources or reservoirs reside)
- Incubation period
- Transmission routes
- Infectivity (i.e., communicability)
- Duration of infectivity

Clinical

- Symptoms
- Signs
- Risk factors for acquisition of infection
- Morbidity
- Mortality
- Risk factors for morbidity and mortality
- Diagnostic methods (sensitivity, specificity, biosafety)
- Therapy (availability, efficacy, safety)

Weber DJ, et al. Am J Infect Control 2016;44:e91-100 UNC Health

14

KEY CONSIDERATIONS IN ASSESSING AND MANAGING THE THREAT OF AN EMERGING INFECTIOUS DISEASE

Infection Prevention

- Environmental survival
- Germicide susceptibility
- Isolation recommendations
- Recommended personal protective equipment
- Pre-exposure prophylaxis (availability, efficacy, safety)
- Post-exposure prophylaxis (availability, efficacy, safety)
- Recommended biosafety level in the laboratory
- Recommended waste disposal (liquids and solids)

Managing a pandemic

- Sensitive and specific (ideally rapid) diagnostic test
- Early identification of patients
- Protecting our healthcare personnel (appropriate isolation, PPE, donning, doffing)
- Sufficient staff, inpatient/ICU beds, ventilators
- Managing shortages
- Rapid development and approval of therapeutics and vaccines

Weber DJ, et al. Am J Infect Control 2016;44:e91-100 UNC Health

15

What's Increasing Our Risk?

- More than 900 new viruses identified since 2009
- Human encroachment on natural habitats
- Climate change
- Wet markets
- "Jump Zones"
 - Areas with the greatest risk of viruses jumping from bats to humans
 - West Africa: 1 in 5 people at risk; exploitation of natural resources
 - China & Laos: where COVID-19 began, and where scientists have found the closest relatives in wildlife to the virus responsible for the current pandemic
 - India: Almost half a billion people live in fast-expanding jump zones, the most of any nation
 - Brazil: the most land at risk of any country



16

Department of Infection Prevention | UNC Medical Center

UNC Health

16

NSPS Overview



What is the NSPS?

The National Special Pathogen System (NSPS) is a tiered System of Care with four facility levels (e.g., Level 1, Level 2, Level 3, Level 4) that have increasing capabilities to care for suspected or confirmed patients with High Consequence Infectious Diseases (HCIDs).

UNC Health

17

NSPS Mission, Vision, & Goals



Mission

To develop a coordinated network of high-quality special pathogen care dedicated to protecting patients, communities, and the health care workforce in the United States.

Vision

To save lives and protect the health care workforce through an agile and comprehensive special pathogen system of care.

ASPIRATIONAL GOALS



Zero
Preventable Deaths
after special pathogen infection



2 hours
Network Mobilization
after suspected special pathogen infection



100%
Have Access
to high-quality special pathogen care for all of the U.S. population

UNC Health

18

Marburg Virus Disease (MVD)

- **Signs & Symptoms**
 - Sudden onset with fever, chills, headache, myalgia
 - Around day 5: maculopapular rash (usually on trunk)
 - Nausea, vomiting, diarrhea, sore throat, abdominal pain
 - Increasing severity: jaundice, pancreatitis, weight loss, delirium
- **Treatments**
 - EA-IND mAb is available
 - Remdesivir
- **Supportive therapy:**
 - Intravenous fluids
 - electrolyte replacement
 - supplemental oxygen
 - blood and blood product replacement



25

UNC Health

Lassa Fever

- **Arenaviral hemorrhagic fever**
 - First case identified in 1969
 - Infects humans
- **Spread by the common African rat excreta**
 - Transmitted by inhalation, digestion, and direct contact with broken skin
- **Incubation:** 6-21 days
- Approximately 80% of patients are asymptomatic or experience only mild febrile illness
- Disease is more severe in persons who are pregnant



26

UNC Health

Lassa Fever

- **Signs & symptoms (severe illness)**
 - Hemorrhaging from gums, eyes, or nose
 - Respiratory distress
 - Vomiting
 - Facial swelling
 - Hearing loss
 - Encephalitis
- **Treatment**
 - Ribavirin
 - Supportive care
 - Consider co-infection



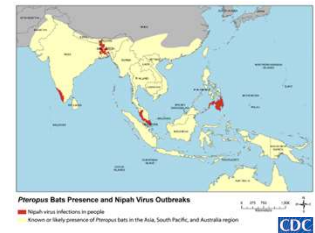
CDC

27

UNC Health

Nipah Virus (NiV)

- First discovered in 1999
- Known to primarily infect humans and pigs
- Spread by fruit bats (flying foxes) via saliva and urine
- **Transmission occurs by:**
 - Direct contact with infected animals
 - Consuming foods made with contaminated animal products
 - Person to person via direct contact and respiratory secretions
- **Incubation period:** 4-32 days
- **Recent outbreaks:**
 - Jan-Feb 2023 (Bangladesh)



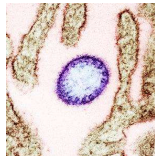
28

UNC Health

Nipah Virus (NiV)

- **Signs & symptoms**
 - Initial
 - Fever, headache, cough, sore throat, vomiting, difficulty breathing
 - Severe
 - Confusion, seizures, encephalitis, acute respiratory distress, coma
 - Long term
 - Persistent convulsions, personality changes

- **Treatment**
 - Supportive care
 - EA-IND mAb



NIH Integrated Research Facility

29

UNC Health

Crimean-Congo Hemorrhagic Fever Virus (CCHF)

- First recognized in 1944
- Ticks act as both a reservoir and a vector
- Human transmission occurs via exposure to an infected tick or infected animal blood
 - Also known to occur through improperly sterilized medical equipment
 - Human-to-human transmission via infected bodily fluids
- Length of incubation period depends on how the virus was acquired
 - Tick bite: 1-3 days
 - Other blood/bodily fluid exposure: 5-6 days
- **Recent outbreaks**
 - 2022, Iraq
 - 2023, Georgia, Senegal, Namibia, Macedonia (single patient & HCW)

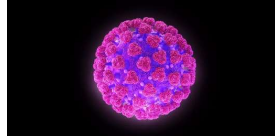


30

UNC Health

Crimean-Congo Hemorrhagic Fever Virus (CCHF)

- **Signs and symptoms**
 - Sudden onset
 - Headache, fever, back & joint pain, stomach pain, vomiting
 - Followed by red eyes, flushed face, and petechiae on palate
 - Petechiae may progress to ecchymoses and other hemorrhagic findings
 - Severe illness
 - Hepatitis, rapid kidney deterioration, liver failure, or pulmonary failure
- **Treatment**
 - Supportive care
 - Ribavirin



UTMB SPECTRE Program

31

UNC Health

New World Arenaviruses – South American Hemorrhagic Fevers

- **Very similar presentation**
 - Initial malaise, conjunctival injection, retro-orbital pain followed by sustained by moderate fever and GI symptoms
 - Hemorrhage, neurological involvement, leukopenia and thrombocytopenia are more often seen in the South American HFs than in Lassa fever
- **About 30% of patients develop more severe hemorrhagic or prominent neurologic manifestations, or secondary bacterial infections**
 - Hemorrhage most commonly seen in skin & mucous membranes (GI tract), intracranium, kidneys, pericardium, spleen, adrenal glands, and lungs
- **Incubation period of 6-14 days**
- **Spread via contact with excretions of an infected rodent**
 - Contaminated food
 - Broken skin
 - Inhalation of particles from excrement
- **P2P transmission rare or unconfirmed for some viruses**
- **Surveillance and reporting lower priorities due to:**
 - COVID-19
 - National health system collapse (Venezuela)

32

Department of Infection Prevention | UNC Medical Center

UNC Health

Junin (Argentinian HF)

- **Isolated in 1958 and first found in corn harvesters in the Argentinian pampas**
 - Region currently at risk includes upwards of 5 million people
- **Reservoir is the drylands vesper mouse**
- **Transmission usually occurs via inhalation of contaminated mouse excrement in dry dust**
- **3 phases: prodromal, neurologic hemorrhagic, and convalescence**
 - Hemorrhagic symptoms + seizures
- **Treated with ribavirin and plasma (if available & given early)**
- **CFR 15-30%**
- **Candid #1 vaccine**
 - 95-98% efficacy with up to 10 years of protection, resulting in very few cases today

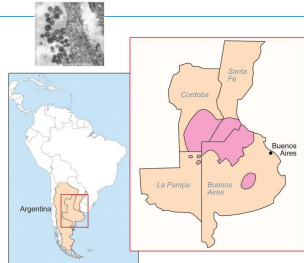


Figure 21-2 Geographic distribution of Junin virus in Argentina. Reproduced with permission from [1].
Reproduced by: [1], [2], [3], [4], [5], [6], [7], [8], [9], [10], [11], [12], [13], [14], [15], [16], [17], [18], [19], [20], [21], [22], [23], [24], [25], [26], [27], [28], [29], [30], [31], [32], [33], [34], [35], [36], [37], [38], [39], [40], [41], [42], [43], [44], [45], [46], [47], [48], [49], [50], [51], [52], [53], [54], [55], [56], [57], [58], [59], [60], [61], [62], [63], [64], [65], [66], [67], [68], [69], [70], [71], [72], [73], [74], [75], [76], [77], [78], [79], [80], [81], [82], [83], [84], [85], [86], [87], [88], [89], [90], [91], [92], [93], [94], [95], [96], [97], [98], [99], [100], [101], [102], [103], [104], [105], [106], [107], [108], [109], [110], [111], [112], [113], [114], [115], [116], [117], [118], [119], [120], [121], [122], [123], [124], [125], [126], [127], [128], [129], [130], [131], [132], [133], [134], [135], [136], [137], [138], [139], [140], [141], [142], [143], [144], [145], [146], [147], [148], [149], [150], [151], [152], [153], [154], [155], [156], [157], [158], [159], [160], [161], [162], [163], [164], [165], [166], [167], [168], [169], [170], [171], [172], [173], [174], [175], [176], [177], [178], [179], [180], [181], [182], [183], [184], [185], [186], [187], [188], [189], [190], [191], [192], [193], [194], [195], [196], [197], [198], [199], [200], [201], [202], [203], [204], [205], [206], [207], [208], [209], [210], [211], [212], [213], [214], [215], [216], [217], [218], [219], [220], [221], [222], [223], [224], [225], [226], [227], [228], [229], [230], [231], [232], [233], [234], [235], [236], [237], [238], [239], [240], [241], [242], [243], [244], [245], [246], [247], [248], [249], [250], [251], [252], [253], [254], [255], [256], [257], [258], [259], [260], [261], [262], [263], [264], [265], [266], [267], [268], [269], [270], [271], [272], [273], [274], [275], [276], [277], [278], [279], [280], [281], [282], [283], [284], [285], [286], [287], [288], [289], [290], [291], [292], [293], [294], [295], [296], [297], [298], [299], [300], [301], [302], [303], [304], [305], [306], [307], [308], [309], [310], [311], [312], [313], [314], [315], [316], [317], [318], [319], [320], [321], [322], [323], [324], [325], [326], [327], [328], [329], [330], [331], [332], [333], [334], [335], [336], [337], [338], [339], [340], [341], [342], [343], [344], [345], [346], [347], [348], [349], [350], [351], [352], [353], [354], [355], [356], [357], [358], [359], [360], [361], [362], [363], [364], [365], [366], [367], [368], [369], [370], [371], [372], [373], [374], [375], [376], [377], [378], [379], [380], [381], [382], [383], [384], [385], [386], [387], [388], [389], [390], [391], [392], [393], [394], [395], [396], [397], [398], [399], [400], [401], [402], [403], [404], [405], [406], [407], [408], [409], [410], [411], [412], [413], [414], [415], [416], [417], [418], [419], [420], [421], [422], [423], [424], [425], [426], [427], [428], [429], [430], [431], [432], [433], [434], [435], [436], [437], [438], [439], [440], [441], [442], [443], [444], [445], [446], [447], [448], [449], [450], [451], [452], [453], [454], [455], [456], [457], [458], [459], [460], [461], [462], [463], [464], [465], [466], [467], [468], [469], [470], [471], [472], [473], [474], [475], [476], [477], [478], [479], [480], [481], [482], [483], [484], [485], [486], [487], [488], [489], [490], [491], [492], [493], [494], [495], [496], [497], [498], [499], [500], [501], [502], [503], [504], [505], [506], [507], [508], [509], [510], [511], [512], [513], [514], [515], [516], [517], [518], [519], [520], [521], [522], [523], [524], [525], [526], [527], [528], [529], [530], [531], [532], [533], [534], [535], [536], [537], [538], [539], [540], [541], [542], [543], [544], [545], [546], [547], [548], [549], [550], [551], [552], [553], [554], [555], [556], [557], [558], [559], [560], [561], [562], [563], [564], [565], [566], [567], [568], [569], [570], [571], [572], [573], [574], [575], [576], [577], [578], [579], [580], [581], [582], [583], [584], [585], [586], [587], [588], [589], [590], [591], [592], [593], [594], [595], [596], [597], [598], [599], [600], [601], [602], [603], [604], [605], [606], [607], [608], [609], [610], [611], [612], [613], [614], [615], [616], [617], [618], [619], [620], [621], [622], [623], [624], [625], [626], [627], [628], [629], [630], [631], [632], [633], [634], [635], [636], [637], [638], [639], [640], [641], [642], [643], [644], [645], [646], [647], [648], [649], [650], [651], [652], [653], [654], [655], [656], [657], [658], [659], [660], [661], [662], [663], [664], [665], [666], [667], [668], [669], [670], [671], [672], [673], [674], [675], [676], [677], [678], [679], [680], [681], [682], [683], [684], [685], [686], [687], [688], [689], [690], [691], [692], [693], [694], [695], [696], [697], [698], [699], [700], [701], [702], [703], [704], [705], [706], [707], [708], [709], [710], [711], [712], [713], [714], [715], [716], [717], [718], [719], [720], [721], [722], [723], [724], [725], [726], [727], [728], [729], [730], [731], [732], [733], [734], [735], [736], [737], [738], [739], [740], [741], [742], [743], [744], [745], [746], [747], [748], [749], [750], [751], [752], [753], [754], [755], [756], [757], [758], [759], [760], [761], [762], [763], [764], [765], [766], [767], [768], [769], [770], [771], [772], [773], [774], [775], [776], [777], [778], [779], [780], [781], [782], [783], [784], [785], [786], [787], [788], [789], [790], [791], [792], [793], [794], [795], [796], [797], [798], [799], [800], [801], [802], [803], [804], [805], [806], [807], [808], [809], [810], [811], [812], [813], [814], [815], [816], [817], [818], [819], [820], [821], [822], [823], [824], [825], [826], [827], [828], [829], [830], [831], [832], [833], [834], [835], [836], [837], [838], [839], [840], [841], [842], [843], [844], [845], [846], [847], [848], [849], [850], [851], [852], [853], [854], [855], [856], [857], [858], [859], [860], [861], [862], [863], [864], [865], [866], [867], [868], [869], [870], [871], [872], [873], [874], [875], [876], [877], [878], [879], [880], [881], [882], [883], [884], [885], [886], [887], [888], [889], [890], [891], [892], [893], [894], [895], [896], [897], [898], [899], [900], [901], [902], [903], [904], [905], [906], [907], [908], [909], [910], [911], [912], [913], [914], [915], [916], [917], [918], [919], [920], [921], [922], [923], [924], [925], [926], [927], [928], [929], [930], [931], [932], [933], [934], [935], [936], [937], [938], [939], [940], [941], [942], [943], [944], [945], [946], [947], [948], [949], [950], [951], [952], [953], [954], [955], [956], [957], [958], [959], [960], [961], [962], [963], [964], [965], [966], [967], [968], [969], [970], [971], [972], [973], [974], [975], [976], [977], [978], [979], [980], [981], [982], [983], [984], [985], [986], [987], [988], [989], [990], [991], [992], [993], [994], [995], [996], [997], [998], [999], [1000].

33

Department of Infection Prevention | UNC Medical Center

UNC Health

Junin (Argentinian HF)

- **Isolated in 1958 and first found in corn harvesters in the Argentinian pampas**
 - Region currently at risk includes upwards of 5 million people
- **Reservoir is the drylands vesper mouse**
- **Transmission usually occurs via inhalation of contaminated mouse excrement in dry dust**
- **3 phases: prodromal, neurologic hemorrhagic, and convalescence**
 - Hemorrhagic symptoms + seizures
- **Treated with ribavirin and plasma (if available & given early)**
- **CFR 15-30%**
- **Candid #1 vaccine**
 - 95-98% efficacy with up to 10 years of protection, resulting in very few cases today

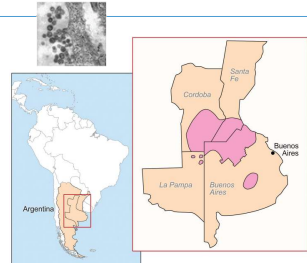


Figure 21-2 Geographic distribution of Junin virus in Argentina. Reproduced with permission from [1].
Reproduced by: [1], [2], [3], [4], [5], [6], [7], [8], [9], [10], [11], [12], [13], [14], [15], [16], [17], [18], [19], [20], [21], [22], [23], [24], [25], [26], [27], [28], [29], [30], [31], [32], [33], [34], [35], [36], [37], [38], [39], [40], [41], [42], [43], [44], [45], [46], [47], [48], [49], [50], [51], [52], [53], [54], [55], [56], [57], [58], [59], [60], [61], [62], [63], [64], [65], [66], [67], [68], [69], [70], [71], [72], [73], [74], [75], [76], [77], [78], [79], [80], [81], [82], [83], [84], [85], [86], [87], [88], [89], [90], [91], [92], [93], [94], [95], [96], [97], [98], [99], [100], [101], [102], [103], [104], [105], [106], [107], [108], [109], [110], [111], [112], [113], [114], [115], [116], [117], [118], [119], [120], [121], [122], [123], [124], [125], [126], [127], [128], [129], [130], [131], [132], [133], [134], [135], [136], [137], [138], [139], [140], [141], [142], [143], [144], [145], [146], [147], [148], [149], [150], [151], [152], [153], [154], [155], [156], [157], [158], [159], [160], [161], [162], [163], [164], [165], [166], [167], [168], [169], [170], [171], [172], [173], [174], [175], [176], [177], [178], [179], [180], [181], [182], [183], [184], [185], [186], [187], [188], [189], [190], [191], [192], [193], [194], [195], [196], [197], [198], [199], [200], [201], [202], [203], [204], [205], [206], [207], [208], [209], [210], [211], [212], [213], [214], [215], [216], [217], [218], [219], [220], [221], [222], [223], [224], [225], [226], [227], [228], [229], [230], [231], [232], [233], [234], [235], [236], [237], [238], [239], [240], [241], [242], [243], [244], [245], [246], [247], [248], [249], [250], [251], [252], [253], [254], [255], [256], [257], [258], [259], [260], [261], [262], [263], [264], [265], [266], [267], [268], [269], [270], [271], [272], [273], [274], [275], [276], [277], [278], [279], [280], [281], [282], [283], [284], [285], [286], [287], [288], [289], [290], [291], [292], [293], [294], [295], [296], [297], [298], [299], [300], [301], [302], [303], [304], [305], [306], [307], [308], [309], [310], [311], [312], [313], [314], [315], [316], [317], [318], [319], [320], [321], [322], [323], [324], [325], [326], [327], [328], [329], [330], [331], [332], [333], [334], [335], [336], [337], [338], [339], [340], [341], [342], [343], [344], [345], [346], [347], [348], [349], [350], [351], [352], [353], [354], [355], [356], [357], [358], [359], [360], [361], [362], [363], [364], [365], [366], [367], [368], [369], [370], [371], [372], [373], [374], [375], [376], [377], [378], [379], [380], [381], [382], [383], [384], [385], [386], [387], [388], [389], [390], [391], [392], [393], [394], [395], [396], [397], [398], [399], [400], [401], [402], [403], [404], [405], [406], [407], [408], [409], [410], [411], [412], [413], [414], [415], [416], [417], [418], [419], [420], [421], [422], [423], [424], [425], [426], [427], [428], [429], [430], [431], [432], [433], [434], [435], [436], [437], [438], [439], [440], [441], [442], [443], [444], [445], [446], [447], [448], [449], [450], [451], [452], [453], [454], [455], [456], [457], [458], [459], [460], [461], [462], [463], [464], [465], [466], [467], [468], [469], [470], [471], [472], [473], [474], [475], [476], [477], [478], [479], [480], [481], [482], [483], [484], [485], [486], [487], [488], [489], [490], [491], [492], [493], [494], [495], [496], [497], [498], [499], [500], [501], [502], [503], [504], [505], [506], [507], [508], [509], [510], [511], [512], [513], [514], [515], [516], [517], [518], [519], [520], [521], [522], [523], [524], [525], [526], [527], [528], [529], [530], [531], [532], [533], [534], [535], [536], [537], [538], [539], [540], [541], [542], [543], [544], [545], [546], [547], [548], [549], [550], [551], [552], [553], [554], [555], [556], [557], [558], [559], [560], [561], [562], [563], [564], [565], [566], [567], [568], [569], [570], [571], [572], [573], [574], [575], [576], [577], [578], [579], [580], [581], [582], [583], [584], [585], [586], [587], [588], [589], [590], [591], [592], [593], [594], [595], [596], [597], [598], [599], [600], [601], [602], [603], [604], [605], [606], [607], [608], [609], [610], [611], [612], [613], [614], [615], [616], [617], [618], [619], [620], [621], [622], [623], [624], [625], [626], [627], [628], [629], [630], [631], [632], [633], [634], [635], [636], [637], [638], [639], [640], [641], [642], [643], [644], [645], [646], [647], [648], [649], [650], [651], [652], [653], [654], [655], [656], [657], [658], [659], [660], [661], [662], [663], [664], [665], [666], [667], [668], [669], [670], [671], [672], [673], [674], [675], [676], [677], [678], [679], [680], [681], [682], [683], [684], [685], [686], [687], [688], [689], [690], [691], [692], [693], [694], [695], [696], [697], [698], [699], [700], [701], [702], [703], [704], [705], [706], [707], [708], [709], [710], [711], [712], [713], [714], [715], [716], [717], [718], [719], [720], [721], [722], [723], [724], [725], [726], [727], [728], [729], [730], [731], [732], [733], [734], [735], [736], [737], [738], [739], [740], [741], [742], [743], [744], [745], [746], [747], [748], [749], [750], [751], [752], [753], [754], [755], [756], [757], [758], [759], [760], [761], [762], [763], [764], [765], [766], [767], [768], [769], [770], [771], [772], [773], [774], [775], [776], [777], [778], [779], [780], [781], [782], [783], [784], [785], [786], [787], [788], [789], [790], [791], [792], [793], [794], [795], [796], [797], [798], [799], [800], [801], [802], [803], [804], [805], [806], [807], [808], [809], [810], [811], [812], [813], [814], [815], [816], [817], [818], [819], [820], [821], [822], [823], [824], [825], [826], [827], [828], [829], [830], [831], [832], [833], [834], [835], [836], [837], [838], [839], [840], [841], [842], [843], [844], [845], [846], [847], [848], [849], [850], [851], [852], [853], [854], [855], [856], [857], [858], [859], [860], [861], [862], [863], [864], [865], [866], [867], [868], [869], [870], [871], [872], [873], [874], [875], [876], [877], [878], [879], [880], [881], [882], [883], [884], [885], [886], [887], [888], [889], [890], [891], [892], [893], [894], [895], [896], [897], [898], [899], [900], [901], [902], [903], [904], [905], [906], [907], [908], [909], [910], [911], [912], [913], [914], [915], [916], [917], [918], [919], [920], [921], [922], [923], [924], [925], [926], [927], [928], [929], [930], [931], [932], [933], [934], [935], [936], [937], [938], [939], [940], [941], [942], [943], [944], [945], [946], [947], [948], [949], [950], [951], [952], [953], [954], [955], [956], [957], [958], [959], [960], [961], [962], [963], [964], [965], [966], [967], [968], [969], [970], [971], [972], [973], [974], [975], [976], [977], [978], [979], [980], [981], [982], [983], [984], [985], [986], [987], [988], [989], [990], [991], [992], [993], [994], [995], [996], [997], [998], [999], [1000].

34

Department of Infection Prevention | UNC Medical Center

UNC Health

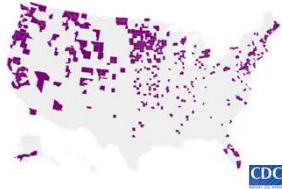


35

"Species of mammals known to be infected with [redacted] viruses to date: ferret, mink, European otter, North American river otter, marine otter, European badger, skunk, Virginia opossum, Amur leopard, Amur tiger, mountain lion, fisher, European polecat, lynx, bobcat, domestic cat, red fox, coyote, raccoon, raccoon dog, South American bush dog, American black bear, brown bear, grizzly bear, Kodiak bear, domestic pig (serology only), grey seal, harbour seal, fur seal, sea lion, porpoise, bottlenose dolphin, short-beaked common dolphin, white sided dolphin, dogs, Japanese raccoon dogs, Beech marten, Caspian seals, Asiatic black bear, Chilean dolphin

Novel Influenza A(H5N1)

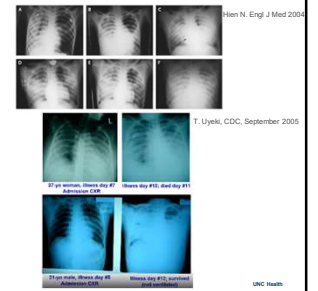
- **Highly Pathogenic Avian Influenza (HPAI)**
- **First outbreak occurred in Hong Kong, 1997**
- Spillover from chickens to humans
- Spread to other parts of the world through trade & bird migration
- Transmission to other mammals also noted
- **Rare, limited human-to-human transmission (household)**
- **Exposure occurs via direct contact with infected birds**
- **Incubation period:** 2-5 days on average
- **Current Situation**
 - 17 human infections in US since 2022, 16 since 2024
 - 1 case with no exposure to animals
 - 5 states with reported cases



37

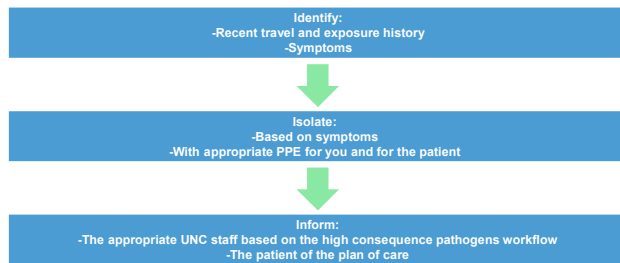
Novel Influenza A(H5N1)

- **Signs & symptoms**
- **Initial (approx. 3 days after exposure)**
 - Fever, cough, sore throat
 - Dyspnea due to lower respiratory involvement often develops early
- **Severe (approx. 6 days after exposure)**
 - Hypoxia
 - Severe pneumonia
 - Leukopenia
 - ARDS
 - Multiorgan dysfunction
- **Treatment**
 - Oseltamivir
 - Supportive care



38

3 Steps to Safety Success: Identify, Isolate, Inform



39

Identify: Early Recognition is KEY

- **Early detection = better protection**
- **Visual cues of a potentially infectious person**
 - Facial cues
 - Puffy face
 - Droopy eyes
 - Dark eyes
 - Red nose
 - Body language
 - Posture
 - Skin
 - Pale or flushed
 - Diaphoretic



40

Identify: Early Recognition is KEY

If a patient looks sick...

Take steps to protect yourself and others

- **Put on PPE**
- **Give the patient a mask**
- **Prepare for what's next**

41

Identify: Early Recognition is KEY

What are we going to ask?

- **Do you have any signs of infection?**
- **Have you traveled lately?**
- **Is there a difference in treatment?**



42

Isolate

•What PPE to use for what pathogen of concern

- Generally, special airborne-contact PPE (or higher)

•Where to place the patient (and how to get them there)

- Which route? Stretcher or wheelchair? How many transporting?
- Room preparation
 - What stays in the room & what leaves?
- Supplies
- Bathroom?

•Who has interacted with the patient?

•Review IP practices

•Waste management

- What are we doing with all the PPE and used supplies?

43

Department of Infection Prevention | UNC Medical Center

UNC Health

43

Preventing future pandemics

- Identify threats early – Identify, Isolate, Inform
- Combat mis- and disinformation
- Engage the community – this is where outbreaks begin and end
- Work with local partners on training and education for special pathogens
- Understand your PPE inventory and how it is tracked
 - Is it real-time tracking?
 - How often is the inventory updated?
- Does your organization have plans for a surge of patients?
 - Staffing plan
 - Bed plan
 - Outpatient clinic plan
 - Waste management plan

44

Modify with Insert • Header and Footer

UNC Health

44



"The worst potential bio-terrorist is nature itself"

Anthony Fauci

45

Modify with Insert • Header and Footer

UNC Health

45