| **Author, Year** | **Sub- category** | **Study Location** | **Study Type** | **Study Design** | **Relevant type of mass casualty event** | **Strategy** | **Findings** | **Outcome Modulators** | **Quality score** |
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| Ablah, 201031 | Biological counter- measures | Nassau Co, NY | Exercise, drill, or training program | Post only with comparison group: Hybrid POD model | Infectious disease: Anthrax | Use of centralized POD model, as compared with a hybrid POD model. | Centralized POD model had slightly faster processing time than the hybrid model.  Centralized and hybrid models had similar quality control outcomes overall. However, hybrid models were more likely to follow the individual steps in the protocol designed to reduce medication error. Centralized PODs were slightly more accurate in dispensing the correct medication. Centralized POD processed 0.75 patients/minute, compared with 0.48 patients per minute. | This only looked at 1st responder/receivers and family, not general population. | 6/8 |
| Arora, 201032 | Biological counter- measures  \*Also in Augment resources | Not relevant | Computer simulation | N/A | Infectious disease: Influenza | 1) Determine what proportion of CDC stockpile to preallocate in response to pandemic flu outbreak.  2) Implement mutual aid agreements that allow transshipment of antivirals between counties.  3) Allocate CDC stockpile according to age group, gross attack rate, or population only.  4) Determine what proportion of CDC stockpile to use for prophylaxis vs. treatment for pandemic flu outbreak. | Postponing allocation is optimal by allowing allocation according to the infected population rather than the susceptible population.  Transshipment through mutual aid agreements is an optimal policy when infection rates vary across counties and counties with small populations are affected.  Allocate CDC antiviral stockpile according to gross attack rates rather than population is the optimal strategy. Age-based allocation may also be optimal.  Limit use of CDC antiviral stockpile for prophylaxis when supplies are limited and focus on treatment instead. | Vaccine effectiveness is lower among the elderly | 4/7 |
| Bravata, 200633 | Biological counter- measures | Not relevant | Computer simulation | N/A | Infectious disease: Anthrax | Comparison of broad categories of strategies, including: (1) enhancing bioterrorism event detection, (2) increasing local dispensing capacity, (3) increasing local inventories of antibiotics, and (4) increasing the amount of inventory deployed from the SNS to the site of an attack. | Surveillance strategies to enhance attack detection do not result in reduced mortality when dispensing capacity is low.  Increasing local antibiotic stockpiles and instituting surveillance systems to reduce the delay in attack detection, are cost-effective only if the community can achieve a high dispensing capacity, if the probability of an attack is greater than 0.0001 per year, and if the attack is large. | N/A | 7/9 |
| Glasser, 201035 | Biological counter- measures | Not relevant | Computer simulation | N/A | Infectious disease: Influenza | Target pandemic flu vaccine to specific demographic groups | A strategy of vaccinating children, adolescents, and young adults reduced morbidity the most during a simulated pandemic, while a strategy of vaccinating infants, older adults, and young adults had the largest impact on reducing mortality. | N/A | 2/7 |
| Koh, 200830 | Biological counter- measures | Boston, MA | Exercise, drill, or training program | Post only with comparison group: Implicit benchmark standard | Infectious disease: Anthrax | 1) A streamlined Point of Dispensing (POD) strategy for mass distribution of antibiotics within 48 hours after an Anthrax release.  2) A push method of dispensing (via U.S. Postal Service mail carriers) for mass distribution of antibiotics within 48 hours after an Anthrax attack | Number of people served per hour via POD (relative to benchmark standard)- 1988 person/hour (about 33/hour/staff person)  Number of people served per hour via mail carrier - 23,000 persons in 6 hours (120 people/hour/carrier) | Heads of household can pick up meds for all  No identification requirement to register  Preregistered/trained staff insufficient for probable demand  Innovation in training: online and tailored to background (clinical/nonclinical) and commitment (response/leadership  Neighborhood-centric strategy for selecting PODs was seen as important | 6/8 |
| Lee, 200629 | Biological counter- measures | Atlanta, Georgia | Exercise, drill, or training program | Post only with comparison group: 7 counties not using decision support software | Infectious disease: Anthrax | Use of integrated simulation and decision-support software (RealOpt) to determine appropriate staffing for point of dispensing medical countermeasure following Anthrax release. | DeKalb County, the only county participating in the point of dispensing exercise that used RealOpt, achieved the highest throughput compared to all other participating counties. DeKalb was the only county to exceed 450 targeted households; its throughput was 50% higher than the next highest county (which processed only 71% of target households).  External evaluators reported that DeKalb County produced the most efficient floor plan (with no path crossing), the most cost-effective dispensing (lowest labor/throughput value), and the smoothest operations (shortest average wait time, average queue length, and equalized utilization rate). No quantitative measures were reported for these parameters. | Computation time for a simulation required <1 minuted CPU time, compared to 5-10 hours for existing commercial software.  Combined computation time (using RealOpt) for total 860,000 households was 30 minutes. | 4/8 |
| McCaw, 200836 | Biological counter- measures | Not relevant | Computer simulation | N/A | Infectious disease: Influenza | Optimal strategy for allocation of antivirals from the Strategic National Stockpile (SNS) during an influenza pandemic (if there ARE two effective drugs) | The two drug strategy (give a different drug to Cases versus their Contacts – i.e. use a different drug for treatment versus prophylaxis) is superior to other strategies because it produces greater delays in: a) propagation of the epidemic and b) the emergence of drug resistance (including multi-drug resistance), but when resistance does emerge, it is more likely to be multi-drug resistance. | The implications of multidrug resistance are strongly dependent on the relative fitness of mutant strains, with the potential for either reduced or extended delays to an uncontrolled outbreak.  Strategies that allocate different drugs to treated cases and their close contacts are likely to be most effective at constraining the rate of resistance emergence | 7/9 |
| McVernon, 201037 | Biological counter- measures | Not relevant | Computer simulation | N/A | Infectious disease: Influenza | Continuous pre-exposure prophylaxis for health care workers during a influenza pandemic | Provision of continuous pre-exposure prophylaxis to 300,000 HCWs consumed 46% of the stockpile over 18 weeks. While appreciably depleting resources, such use had a negligible impact on the containment effort. Continuous distribution of antiviral prophylaxis to healthcare workers (HCWs)is considered necessary in the early phases of the pandemic response to ensure continuity of healthcare services, the finding suggest it does not compromise population disease control. | N/A | 4/7 |
| Medlock, 200938 | Biological counter- measures | Not relevant | Computer simulation | N/A | Infectious disease: Influenza | Model to determine optimal vaccine allocation strategy for mass prophylaxis to a novel virus | Mortality (relative to status quo strategy) and other outcomes were usually most reduced by vaccinating children 5-19 years old (highest transmission group) and child-rearing aged adults (30-39 years), but reduced mortality by 20-40% relative to current CDC recommendations. | Optimal strategy depends on which outcome gets priority (deaths averted, life years saved, etc.)  Outcome depends on age-group related transmission rate  Outcome depends on age-specific mortality  Outcome depends on age-specific vaccine efficacy | 5/9 |
| Wein, 200341 | Biological counter- measures (POD)  \*Also in Augment resources | Not relevant | Computer simulation | N/A | Infectious disease: Anthrax | 1) Aggressive and rapid antibiotic distribution post Anthrax mass attack detection  2) Dramatically expanded POD & hospital surge capacity (for example by cross training, and using non-hospital volunteers to extend trained personnel, and mobile servers from other federal agencies to provide hospital surge capacity) | The Number of Deaths (relative to base case strategy of no or very delayed treatment) is a function of the speed of distribution - Mass antibiotic distribution reduces deaths to 123,000 (8.3% of base case) versus 660,000 deaths (44% of base case) if only symptomatic patients are treated  Number of Deaths (relative to base case strategy) - function of hospital capacity - dramatically decreased with sufficient personnel - ten-fold or more, and mobile servers (e.g., from other federal agencies) | Antibiotic Efficacy  Adherence to prophylactic regimen  Adding mobile servers (to provide surge hospital care) is more effective than adding local servers because the former are typically less busy and therefore more available. | 5/9 |
| Zaric, 200842 | Biological counter- measures | Not relevant | Computer simulation | N/A | Infectious disease: Anthrax | Develop a model to optimize the logistical response to a bioterrorism event. | The demonstration model provides the following insights: (1) communities should focus on dispensing capacity rather than stockpiling of supplies. (2) improved surveillance can reduce mortality if adequate dispensing capacity exists. (3) the mortality from an attack is significantly affected by the number of unexposed individuals who seek prophylaxis and treatment. | N/A | 3/9 |
| Zenihana, 201043 | Biological counter- measures | Not relevant | Computer simulation | N/A | Infectious disease: Smallpox | A combination of mass vaccination, contact tracing and vaccination, and school closure as countermeasures to a smallpox bioterrorism attack | A combination of mass vaccination and contact tracing and vaccination can lead to lower mortality, quicker eradication, and less vaccine use than either strategy separately. School closure potentiates the effect of all strategies. | Time required to trace contacts  Number of days between index patient and start of countermeasures  1-day vs. 2-day mass vaccination periods | 3/7 |
| Cahill, 200834 | Non-biological counter- measures | Not relevant | Computer simulation | N/A | Infectious disease: Influenza | Distribute surgical masks or N95 respirators to the public to limit the spread of pandemic influenza (both droplet and airborne transmission). | Use of N95 respirators lowers the probability of infection and the percentage of the population infected compared to surgical masks. Estimated outpatient visits for the N95 mask (100% compliance) were 14,330, as compared to the surgical mask (100% compliance) with 56,200 outpatient visits. However, at 60% compliance, this range narrows to 126,640-128,070.  Use of N95 respirators reduces use of hospital beds, ICU beds, and ventilators compared to surgical masks. Estimated hospitalizations for the N95 mask (100% compliance) were 300, as compared to the surgical mask (100% compliance) with 1,190 hospitalizations. However, at 60% compliance, this range narrows to 580-590.  N95 respirators and surgical masks had comparable impacts on workdays lost and total economic losses at compliance levels of 60%, but respirators were superior when compliance levels were 100%. | Optimal strategy depends on attack rate and level of compliance wearing masks.  Protective efficiency of mask types is based on theoretical calculations involving droplet size, not empiric evidence | 2/9 |
| Savoia, 200939 | Non-biological counter- measures | US | Exercise, drill, or training program | Pre-post | Infectious disease: Influenza | Tabletop Exercise (and didactic session) to train Public Health officials in what steps they can legally take to limit spread in response to a pandemic | After participating in the course there was a statistically significant increase in most participants' knowledge of and level of confidence in their legal authority to take specific response actions (such as imposing quarantine) to limit pandemic spread. | Legal authority may be present, but procedures to implement that authority may still be lacking...  Legal professionals gained somewhat more knowledge | 4/7 |
| Schull, 200740 | Non-biological counter- measures | Canada/ Australia/ New Zealand | Analysis of single real event | Pre-post with comparison group: Ottawa and London, similar but unaffected regions in Canada | Infectious disease: SARS | Restrict ambulatory and inpatient medical and surgical activity to urgent cases. Respiratory isolation rooms were expanded. Visitor access was severely restricted. A centralized system was created to screen all requests for inter-hospital patient transfers | The rate of overall and medical admissions decreased by 10%–12%; there was no change in the comparison regions.  The rate of elective surgery in Toronto fell by 22% and 15% during the early and late restriction periods respectively and by 8% in the comparison regions.  Decrease in high acuity ED visits and inter-hospital transfers in Toronto relative to comparison regions suggests potential unintended consequences. | N/A | 4/8 |