**accompanying appendix material**

Input variables and model constraints (Figure 1):

1. Initial number of patients at the disaster epicenter are separated into:[[1]](#endnote-1) [[2]](#endnote-2) [[3]](#endnote-3)
   1. Black-triaged patients (20%) that move out-of-system to morgue facilities
   2. Red-triaged patients (20%) that are subsequently moved to ORBs (30%)
   3. Red-triaged patients (20%) that are subsequently moved to CCBs (70%)
   4. Yellow-triaged patients (20%) that are subsequently moved to RFBs (60%)
   5. Yellow-triaged patients (20%) that are subsequently moved to TRBs (40%)
   6. Green-triaged patients (40%) that move out-of-system to home
   7. Total patients are multiplied by 10% and added on as injured rescue workers, 3% of which are yellow-triaged and 7% green-triaged, all presenting at t3.
2. Patient evacuation rates from the disaster epicenter to hospitals:[[4]](#endnote-4) [[5]](#endnote-5) [[6]](#endnote-6) [[7]](#endnote-7) [[8]](#endnote-8) [[9]](#endnote-9)
   1. The maximum total number of patients per time period that can be transported from the disaster epicenter to all hospitals was the evacuation rate (EV) where:

EV = SS\*(AR/SS)\*(TV/AR)\*(patients/TV)\*(1/LM)\*(minutes/hour)

= (1)\*(2)\*(5)\*(2)\*(1/12)\*(60) = 100 maximum total number of patients per hour

period that could be transported from the disaster epicenter to all hospitals, where SS is the number of staging sites within epicenter, AR is access routes, TV is emergency transport vehicles, and LM is loading minutes.

* 1. Sufficient transportation resources are available to move patients to available hospital beds and all critical (red) and serious (yellow) patients leaving the epicenter are moved as long as there is an open bed available at a hospital.
  2. Emergency transport vehicles are not needed to move expired (black) or walking (green) patients to hospitals.

1. Patient out-of-hospital severity-of-disease state transition probabilities:
   1. Out-of-hospital severity-of-disease transitions are distance dependent and occur over the full period of time it takes to get a patient from the disaster epicenter to a hospital.
   2. Red-triaged ORB patients that up-transition to black and move out-of-system to morgue in each time period (10%)
   3. Red-triaged CCB patients that up-transition to red ORBs in each time period (5%)
   4. Red-triaged ORB patients that down-transition to red CCBs in each time period (1%)
   5. Red-triaged CCB patients that down-transition to yellow RFBs in each time period (10%)
   6. Yellow-triaged RFB patients that up-transition to red CCBs in each time period (10%)
   7. Yellow-triaged TRB patients that up-transition to yellow RFBs in each time period (10%)
   8. Yellow-triaged RFB patients that down-transition to yellow TRBs in each period (2%)
   9. Yellow-triaged TRB patients that down-transition to green in each time period (1%)
   10. Green-triaged patients that up-transition to yellow TRBs in each time period (1%)
   11. Green-triaged patients that move out-of-system to home in each time period (10%)
2. Hospital bed transition probabilities and patient dispositions:[[10]](#endnote-10) [[11]](#endnote-11) [[12]](#endnote-12) [[13]](#endnote-13) [[14]](#endnote-14)
   1. Noncritical, non-disaster patients occupying ORBs, CCBs, RFBs, and TRBs that can be discharged are moved out or “reverse-triaged” from hospitals to make room for critical patients from the disaster epicenter, increasing available beds by a total of 30% at the end of t2: 20% from early inpatient discharges, canceling elective admissions and procedures, converting private rooms to double occupancy, and transferring eligible patients to affiliated nursing homes and long term care facilities; and 10% by converting outpatient clinics, conference rooms and hallways to active patient care space.
   2. Hospital CCB capacity includes regular use CCBs + post-anesthesia care beds + advanced-procedure-unit beds + day-surgery beds + OR beds not in use for surgery. No other bed type can be converted into ORBs, and RFBs cannot be converted into CCBs.
   3. Once the beds of any type are filled at any one hospital, patients will be sent to next closest hospital with the appropriate bed types available.
   4. ORB patients that move out-of-system to morgue in each time period (3%)
   5. ORB patients that are post-op and down-transition to a CCB in each time period (25%)
   6. CCB patients that move out-of-system to morgue in each time period (20%)
   7. CCB patients that up-transition to an ORB in each time period (1%)
   8. CCB patients that down-transition to a RFB in each time period (20%)
   9. RFB patients that move out-of-system to morgue in each time period (2%)
   10. RFB patients that up-transition to a CCB in each time period (10%)
   11. RFB patients that down-transition to a TRB and to home in each time period (40%)
   12. TRB patients that move out-of-system to home in the next time period (60%)

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