Quick User Guide: J-IDEA Pandemic Hospital Planner

The J-IDEA Pandemic Hospital Planner allows users to compare hospital capacity under various interventions affecting the supply and organisation of care and the management of admissions, together with assumptions on pandemic progression.
For further information please refer to the Appendix of the reporting accompanying the planner.

The J-IDEA Planner is a spreadsheet composed of five sheets:

- **Readme**: This sheet provides and overview of the tool and the *Intervention Input Matrix* which will show you what information you need to input to evaluate each intervention.
- **Input (Quick):** The essential inputs to be entered by the user.
- **Input (Extended)**: An extended version of *Input (Quick)*, which includes all inputs and variables. Please ensure you add all mandatory inputs for a given intervention.
- **Output (Numeric)**: This sheet is updated automatically based on the inputs to show the numeric changes: spare capacity per 10,000 population; percent change in spare capacity compared to baseline; and staff planner: staff required for total bed numbers. This sheet does <u>not</u> require alteration.
- **Output (Graphical)**: This sheet is updated automatically based on the inputs to show the impact of the interventions on the capacity variables in terms of spare capacity per 10,000 population. This sheet does not require alteration.

Instructions

1. Read the *readme* sheet and review the *Intervention Input Matrix* to determine which intervention(s) to evaluate.
2. Choose either the *Input (Quick)* sheet, for simple but restricted baseline and intervention data entry, or the *Input (Extended)* sheet for more comprehensive baseline and intervention data entry. On your chosen input sheet enter the mandatory baseline inputs under *User Inputs*. The dark blue cells are mandatory and pre-populated with the example values for England. Leave these values as is, if you would like to examine a national case study of England and change if you are evaluating capacity at trust-level or for a different country.
   a. Please note you may edit the *suggested values* in light blue cells on the extended sheet or leave them as is.
   b. Inputs from *Inputs (Quick)* are pulled through to *Inputs (Extended)*. When inputting data into *Inputs (Extended),* to retain quick sheet functionality press the Reset Formulae button to reset the cells to baseline England values and allow for overwrite by *Inputs (Quick).*
   c. COVID-19 related inputs can be based on that which is currently observed, or which represents an assumption of future pandemic progression.
   d. In your chosen input sheet, under *Intervention Assumptions* complete the intervention inputs which are dark yellow in the correct unit (% or number) or use the England example values if applicable to your setting. Using the *Input (Extended)* sheet allows users to review the light-yellow cells which contain values calculated from the dark yellow inputs. You may edit them or leave them as is. (See Appendix of accompanying report).
   e. Once the inputs for your chosen intervention have been filled in, open the *Output (Numeric)* sheet and review the impact of this intervention. If columns C-K (Spare capacity per 10,000 population) and U-Z (Staff required for total bed numbers) are green, then you have sufficient capacity for your inputs of COVID-19 and non-COVID-19 patients. If columns are red, then you have insufficient capacity. The percentage changes from baseline can be viewed in columns L-T.
3. Open the *Output (Graphical)* sheet for a visual representation of how this intervention has impacted the outputs.
4. Test and combine interventions to reach your desired outcome.
   a. If desired, return to the Input sheet to evaluate the different interventions for different numbers of COVID-19 patients.
5. Update values with recent data and run routinely.

Example: set up of field hospitals in England (NHS Nightingale)

You are a national hospital planner examining the option to open NHS Nightingale field hospitals across England. For a given number of COVID-19 patients, what impact would this have on the national capacity in terms of hospital beds? How many more nurses would be needed?

1. Open the *readme* sheet and review the *Intervention Input Matrix*. Select the *Setup of field hospitals* intervention. The matrix shows, that for this intervention, you will need information on the increase in CC Beds and G&A Beds provided.
2. Turn to one of the input sheets. (Cell references below are for *Input (Extended)*).
3. Enter the mandatory baseline inputs related to COVID-19 under *User Inputs* (dark blue cells). For the purpose of this example, assume that there are currently 1,480 COVID-19 patients in CC (cell C20) and 7,770 COVID-19 patients in G&A beds (cell D20). All other baseline inputs are already inputted according to the England case study.
4. Under *Intervention Assumptions*, complete the intervention inputs under *Intervention Assumptions* (dark yellow cells). For *Set up of field hospitals* (Row 31) these are CC Beds (cell O31) and G&A Beds (cell P31).
5. Enter *500* into the field for CC Beds (cell O31) for the addition of 500 critical care (CC) beds from NHS Nightingale.
6. Enter *8000* into the field for G&A Beds (cell P31) for the addition of 8,000 general & acute (G&A) beds from NHS Nightingale.
7. The intervention data input is complete and you can now analyse the outcome. Open the *Outputs (Numeric)* sheet and review the changes to *Set up of field hospitals* on row 19.
8. Under the percent change in spare capacity compared to the baseline for CC beds (column L), you will see there is a 64% increase in excess CC beds and an increase of 4767% in spare G&A beds (column M).
9. Despite this improvement in spare capacity, under the *Spare capacity per 10,000 population* output (cells C19-K19), you can see that even with this addition of field hospitals there remains a deficit in CC beds, CC nurses and CC junior doctors for the input number of COVID-19 patients (as indicated by the negative numbers/red colour). You can conclude that setting up the Nightingale hospital without any additional staffing would not have been sufficient to treat this number of patients requiring critical care.
10. This is further illustrated in row 19 and columns U through Z. If columns are green, that indicates that you have sufficient staff to operationalise all beds. If a column is red, that means you have insufficient staff.
    a. 21,587 G&A nurses would be needed for total G&A bed numbers (Cell V17). This cell is green which shows there are enough G&A nurses.
    b. 4,623 nurses would be needed for total CC bed numbers (Cell U17). This cell is red which shows there are not enough CC nurses.
11. Open the *Output (Graphical)* sheet to visually explore how this intervention affects spare capacity, which illustrates the results in *Output (Numeric)*.
12. You could now return to step 5 to explore how a different intervention would have affected spare capacity and required staff. Alternatively, you could return to step 4 to see how a different number of COVID-19 patients would affect the output (e.g. what if the number of COVID-19 patients were to double?).