FINANCE INNOVATION FORUM

INNOVATION - 01

A&E DEMOGRAPHICS ANALYSER

TOM MITCHELL & VINOD BASSI

LEEDS TEACHING HOSPITALS NHS TRUST

NORTH EAST AND YORKSHIRE, ACUTE

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THE INNOVATORS

This tool was created by myself (Tom Mitchell) and manager (Vinod Bassi). As members of the LTHT Costing Team, we always strive to 'do more' with our information to support service improvement. Our efforts have led to expanding clinical engagement, creating opportunity seeking tools and most recently, health inequality dashboards for services such as A&E, Critical Care & Maternity.

THE PROBLEM

Our A&E Service **needs to** understand where health and access inequalities exist and how pathways could be streamlined to improve capacity, patient flow and experience. **Otherwise** patients may be adversely affected by demographic factors without the service realising, and operational pressures arising from increasing post-Covid demand could severely impact service capability.

THE CHALLENGE

How can we support a service to explore, highlight and address the challenges of 'health inequalities' that feature so prominently within the NHS Long Term Plan, and prepare it for increasing 'post-Covid' levels of demand?

THE INNOVATION

Our goal was to harness the potential of our clinical data and collaborate with A&E to create an 'interactive' dashboard tool that would allow them to explore health inequalities and patient flow to ultimately inform service improvement and re-design.

Initially, we considered what we wanted the tool to do, the analysis and key metrics we wanted to create and the data needed to achieve this. From a patient demographic perspective, we could already describe age, gender, and ethnicity, but realised that deprivation was missing. Following further research, we realised this 'gap' could be addressed by using our understanding of patient postcodes and mapping this against information describing our city sourced from the Office for National Statistics (ONS). This would provide us with their IMD Decile (a score of between 1 and 10 with 1 describing the most deprived areas).

Early engagement with operational colleagues was essential to identify and understand the data generated by the service to obtain the clinical information we also needed. This included mode of arrival, time spent in the department, what patients were being treated for (their 'chief complaint') and discharge destinations.

Having met all of our information requirements, the next challenge was to 'stitch' this together to create a

single, unified data table that would 'power' every aspect of the analysis within our dashboard. To achieve this.

- SQL (a database querying language) was used to extract and combine the varied data strands together at an episodic level to create our unified table.
- Further data quality checks and 'streamlining' was also required to improve accuracy and processing efficiency, and
- Because the data volumes required to satisfy our need for cross-year comparisons exceeded the number of rows that Excel could handle in a single tab, we instead created an 'external connection' to our data so that that it existed outside of our spread sheet.

To design and create our dashboards 'front end', we considered;

- How would users interact and interrogate the data. We understood from earlier conversations how they wanted to 'deep dive' into the information, so designed and created a range of filters and slicers to enable this.
- How to create a logical order and flow through the information to ensure users didn't get lost in a 'data jungle'. We provided key metric 'headlines' and created separate 'demographics' and 'service specific' sections which we structured at varying levels of granularity, from summary, to intermediate and eventually patient level.
- How to transform 'data' into 'information'. We made best use of Excel's charting and pivoting functionality, along with VBA (Visual Basic) know-how to create macro buttons that could toggle different charts views at the press of a button.

Ensuring the tool met the needs of our users was always of paramount importance. We worked closely with the service throughout its development and arranged numerous demos at different stages of progress. This provided us with further challenges, an awareness of other datasets available, but ultimately invaluable improvement feedback!

THE LESSONS LEARNT

- We wouldn't try to create one tool that could be used by both internal and external colleagues. Once our external stakeholders were keen to use the tool, and to meet IG requirements, we recognised the need for an anonymised dataset, and therefore removed data like NHS number. Unfortunately for internal users, this removed the ability to view treatment pathways at an identifiable patent level. We've therefore had to create 2 versions of the tool to satisfy all requirements.
- We learned how to create and use external table connections to overcome the data limitations of an Excel tab. This also improved functionality responsiveness (e.g. the time taken for charts to show filtered results) and dramatically reduces the spread sheet file size. As the data no longer sat within Excel, we also learned how to replicate numerous spread sheet formulas that were needed (e.g. lookups and concatenations) in SQL. As these calculations are now processed on a server rather than a desktop, it is far quicker to create a refreshed data set, if (as is often the case) we need to update the range of months that the tool covers.

THE OUTPUTS

- The creation of our A&E Demographics Analyser.
- A greater awareness of electronic data sets that exist within a clinical area. Not only does this allow us to improve our Patient Level Costing System (PLICS) outputs for this service, it has also improved our capabilities when supporting other clinical engagement projects.
- Finally, for any Costing Team, growing clinical engagement with our outputs always a challenge. This collaboration has raised awareness of what we can do within our A&E Service to support them in providing the best possible care for our patients.

THE OUTCOMES

Numerous benefits including that our A&E Service now has a better understanding of · the demographics of the patients they treat · any inequalities that might exist due to age, race, gender or deprivation. · The numbers of patients admitted for less than a day following their A&E attendance, and if they could have been better served within an ambulatory setting, or · which pathways could benefit from the development of a Same Day Emergency Care (SDEC) facility to prevent patients being admitted to beds unnecessarily. The exposure the tool has received from showing it to external health partners has also highlighted the possibilities and benefits of 'system-wide' collaboration. For example, following a demo to our regional ambulance service, they were keen to understand the numbers of patients they brought to A&E that required no treatments or investigations. Creating alternative pathways for these patients could potentially reduce the demands on our hospital resources.

THE QUICK WINS

Consider and agree what metrics and analysis are important to the service you are working with. A&E had different considerations from other admitted patient services we had previously worked with. Work with the service to understand what data they generate, which fields are important to them, and what they (and the clinical terminology) mean. Research what external information might also be available (e.g. from the ONS) to complement and expand the potentially limited 'story' that internal datasets can explain.

THE REVIEWERS SAID

OFFERS A CLEAR LINK BETWEEN THE WIDER FINANCE DEPARTMENT AND A FRONT-LINE SERVICE, IN THIS CASE ED. THE LINK TO ONS DATA IS A KEY STEP TO LOOKING AT THE WIDER HEALTH ENVIRONMENT

THE SOLUTION ADDRESSES THE PROBLEM OF HELPING UNDERSTAND HEALTH INEQUALITIES AND HENCE IMPROVING PATHWAYS. AN EXCELLENT METHOD OF ANALYSING A&E DATA. WELL DONE!

ALLOWS END USER TO SEE COMPLEX HIGH VOLUME DATA IN A VISUALLY FRIENDLY FORMAT. GRAPHS DISTINGUISH VARIOUS DATASETS AND ALLOW YOU TO FOCUS ON AREA OF CONCERN.

WHAT YOU CAN DO NOW

If you recognise the problem stated and have implemented your own innovation to overcome it please submit this innovation to the programme and give others more examples to learn from.

SUBMIT INNOVATION

If you recognise the problem stated and would like to know more details about this innovation in particular, we will be hosting showcase and workshop sessions throughout the year, so all interested staff can gain ideas and inspiration from innovators in a manageable one-to-many format.

REGISTER INTEREST

If you have a problem but don't currently know of a solution to it, then please submit it here and in 2022 the Forum intends to crowdsource solutions to problems that don't currenlty have known innovations.

SUBMIT PROBLEM

If you would like to learn more about about the innovation programme please click below for more details

LEARN MORE

IN SEPTEMBER 2021 THE FORUM LAUNCHED...

- A national Innovation Programme for NHS Finance staff to submit their innovations for peer review. Successful innovations will be published and accessible to all on the One NHS Finance website
- A 'Software Skills For Finance Staff' event series taught by NHS Finance for NHS Finance including MS Excel, PowerBI, SQL etc.
- An 'Art of the Possible' briefing which explains two new technologies AI & Blockchain and discusses the opportunity for NHS Finance
- An Automation Group to review and improve the efficiency of existing national processes and returns

WHAT YOU CAN DO NOW

- Submit your innovations for peer review
- Sign up to be an innovation peer reviewer
- Read Art of the Possible
- Sign up for Software Skills for Finance
- Register your interest in automation and all things innovative

Innovation Programme

Software Skills

Automation sign up

Be a peer reviewer

Art of the Possible

FURTHER INFORMATION

Website: **FinanceInnovation.nhs.uk**

Email: **finance.innovation@nhs.net**

LinkedIn: **One NHS Finance**

Twitter: **@OneNHSFinance**

ONE NHS FINANCE

One NHS Finance brings together the Future-Focused Finance, National Finance Academy, and the Finance Innovation Forum programmes and networks to make sure that everyone working in NHS Finance has access to skills, knowledge, methods, and opportunities to influence and enhance patient services.

FINANCE INNOVATION FORUM

Identifying and developing innovative ways of working and new areas of improvement.