NHS
South Western
Ambulance Service
NHS Foundation Trust

Draft BNSSG Stroke Redesign – Modelling Impact

1. Introduction

1.1. This paper sets out the impact of the Bristol, North Somerset and South Gloucestershire (BNSSG) Stroke Redesign on South Western Ambulance Services NHS Foundation Trust (SWASFT) as modelled by Operational Research in Health (ORH) Ltd.

2. BNSSG Stroke Redesign

2.1. The existing model conveys patients with suspected stroke symptoms to the nearest acute trust which operate as a Hyper Acute Stroke Unit (HASU) at different hours of the day and days of the week.

Acute Site	**Operating Hours**
Bristol Royal Infirmary (BRI)	7 days a week (08:00 – 23:00hrs)
North Bristol Trust (NBT)	7 days a week (24hrs)
Weston General Hospital (WGH)	Monday to Friday (08:30 – 16:30)

2.2. The new model would result in all eligible patients within a new larger catchment area for NBT being conveyed to a single specific HASU location 24/7 365 days a year at the North Bristol Trust. Other patients would be conveyed to HASUs outside of BNSSG such as Gloucester, Taunton or Bath.

2.3. In addition there will be urgent and emergency secondary transfers required to a higher level of care moving patients from an existing hospital location to the nominated HASU for both patients who self-present with stroke symptoms to another acute Emergency Department (ED) (WGH or BRI) or those patients who suffer a stroke whilst an inpatient.

2.4. Furthermore an increasing number of patients within the thrombectomy network will now be conveyed to the regional thrombectomy centre at NBT as a result of increased operating hours, which will inevitably have a wider impact than just BNSSG hospitals and patients.

2.5. The Thrombectomy Network changes are independent to the proposed adjustments to the HASU arrangement in BNSSG. However, it is recognised that these are inter-dependent and therefore can only be modelled accurately where both are considered and included. However, the impact has been split within the result to represent the proportion of the impact by both changes individually.

3. Modelling

3.1. As a result of the proposed redesign of stroke services within BNSSG ORH Ltd were commissioned to assess the impact this will have on the service provided by SWASFT. Specifically, this included the performance impact as well as the impact on the specific stroke patient group.

3.2. ORH were commissioned to provide this because of the existing work they undertake with ambulance trusts and their experience in modelling operational impact, as well as their access to the broad SWASFT dataset. ORH has developed a simulation model, AmbSim, specifically to model ambulance service operations. Within AmbSim, a virtual replica of SWAST operations has been created .This means ORH already has the Trust's operating model to base any proposed changes on, and then can model and assess the impact.

3.3. Prior to modelling the perceived effect on the Trust was that this would increase the travel times of SWASFT resources for suspected stroke patients, increase activity for secondary transfers of patients suffering a suspected stroke in an acute hospital, and increase activity for the transfer of patients requiring thrombectomy.

3.4. The impact of this is a reduction in the availability of a resource to respond to other incidents, and therefore negatively impact the quality of the service provided to patients in BNSSG and the surrounding area as well as more broadly the performance being delivered by the Trust.

3.5. The Trust is assessed on the performance it delivers across 4 categories of call. The ORH modelling therefore looks to analyse the impact of the changes on the response performance of the Trust. If there is found to be a negative impact on performance they then model the additional resource required to return the Trust to the performance delivered prior to the service change.

3.6. To identify the patients who will be affected by the stroke service redesign, the Ambulance Clinical Quality Indicator (ACQI) incidents were used and shared with ORH. These incidents are those including in the care bundle performance metric for stroke ACQIs and are considered the patients who are identified as FAST positive stroke patients requiring emergency conveyance to a HASU at the point of face to face clinical assessment.

4. Impact

4.1. The outcome from ORH Ltd has proven the hypothesised theory that the stroke service redesign and thrombectomy network increased operational hours in BNSSG will adversely impact the Trust. Appendix A is the full report from ORH.

4.2. As requested they have reviewed the impact of the HASU and thrombectomy independently as well as the combined effect.

Patient Safety and Clinical Care

4.3. The impact of the stroke and thrombectomy service changes described in this paper on patient safety and clinical care must be considered alongside operational performance. As such, the request for additional funding to account for the reduced performance for all categories of calls will ensure no detrimental clinical impact on patients in the South West as a result of these service changes.

4.4. It is also important to consider the impact on individual patients who will now travel further to a single HASU centre rather than to a previously available nearer unit. The modelling has demonstrated that on average patients will travel an additional 8.2 minutes to reach the single HASU at Southmead and the patient who would be worst affected would travel for an additional 15.7 minutes. To ensure this does not negatively impact on patient outcomes,

SWASFT will work with Southmead Stroke team to deliver improvement in Door to Thrombolysis performance, as a centre of excellence, which will ensure these patients do not experience an overall delay in receiving the best standard of intervention. This collaborative improvement would be important to ensure the service redesign does not negatively impact on the pre-hospital element of care.

Activity Impact

4.5. The table overleaf shows the average weekly patients that will be transferred to alternative locations as a result of the stroke elements of the service change, both in diverts from the usual place of attendance, and additional transfers that will be required.

Stroke Diverts

Original Patient Destination	Weekly Patients to Southmead	Weekly Patients to Taunton
Bristol Royal Infirmary	8.0	
Weston General Hospital	2.2	0.6
Total	10.2	0.6

Stroke Transfers

Origin of Transfer	Weekly Patients to Southmead
Bristol Royal Infirmary	6.3
Weston General Hospital	2.3
Total	8.6

4.6. The table below shows the average weekly patients that will be transferred to alternative locations as a result of the thrombectomy element of the service change.

Thrombectomy Transfers

Origin of Transfer	Weekly Patients to Southmead
Bristol Royal Infirmary	0.5
Gloucestershire Royal Hospital	0.2
Great Western Hospital	0.2
Musgrove Park Hospital	0.5
North Bristol NHS Trust (Internal)	1.1
Royal Devon And Exeter Wonford	0.2
Royal United Hospital Bath	1.0
Weston General Hospital	0.1
Yeovil District Hospital	0.2
Total	4.2

4.7. The combined impact of Stroke and Thrombectomy is shown below. This shows the average weekly patients that will be transferred to alternative locations as a result of the service change.

Combined Stroke and Thrombectomy

Origin of Transfer	Weekly Patients to Southmead	Weekly Patients to Taunton
Bristol Royal Infirmary	14.8	0.0
Gloucestershire Royal Hospital	0.2	0.0
Great Western Hospital	0.2	0.0
Musgrove Park Hospital	0.5	0.0
North Bristol NHS Trust (Internal)	1.1	0.0
Royal Devon And Exeter Wonford	0.2	0.0
Royal United Hospital Bath	1.0	0.0
Weston General Hospital	4.6	0.6
Yeovil District Hospital	0.2	0.0
Total	23.0	0.6

Performance Impact

4.8. The combined impact on the Trust's response performance is shown below. This means that in some areas and categories patients will be waiting longer for an ambulance to attend, which has a negative impact on clinical care and patient safety. This table shows the seconds that will be added to the mean performance times as a result of the changes, according to the modelling.

Impact

CCG	Cat1		Cat2		Cat3		Cat4
	Mean	90th	Mean	90th	Mean	90th	90th
NHS BNSSG CCG	0:00:00	0:00:00	0:00:06	0:00:16	0:00:22	0:00:17	-0:00:04
NHS BSW CCG	0:00:01	-0:00:06	0:00:06	0:00:16	0:00:23	0:00:00	0:00:03
NHS Gloucestershire CCG	0:00:01	0:00:05	0:00:03	0:00:00	0:00:21	0:00:21	-0:00:36
NHS Somerset CCG	0:00:02	0:00:00	0:00:05	0:00:11	0:00:25	-0:00:08	0:00:57

4.9. ORH has calculated that the resource required to address the negative performance impact is 36 DCA hours per week. .

Costing

4.10. The table below shows the annual costs associated with the additional resource hours:

Staff Type	**Total WTE**	**TOTAL**
Paramedic B6 25% Unsocial	1.38	£82,135
ECA B3 25% Unsocial	1.1	£35,953
Overheads		£23,618
		£141,706

4.11. Overheads include vehicle running costs, training, management and other support costs.

5. Modelling Limitations

5.1. The modelling is based on the current planned changes from both the Stroke Redesign Project and the Thrombectomy network. It is based on expected activity change information provided by the Stroke Redesign Project and Thrombectomy services.

5.2. During the coming months, and prior to the completion of a final business case, further work will be undertaken, including public consultation. This could change the proposed model, and additional information could be identified in relation to the expected activity changes.

5.3. As a result the impact to the Trust included in this paper is subject to change when the final proposed model and expected activity changes are known.

5.4. Further modelling will be required when the proposed model has been confirmed, and this will also use the most current data available at that time.

5.5. The BNSSG Stroke Redesign Project Group will keep a record of changes to enable the revised modelling to occur.

6. Thrombectomy Network Changes

6.1. It is noted that the Thrombectomy Network may change its parameters or expand during this period and have a negative impact on SWASFT's ability to deliver response performance standards. The changes to the Thrombectomy Network during this time will also be captured, to ensure the adverse impact can be included in the modelling.

7. Summary

7.1. In summary the proposed BNSSG Stroke Redesign and thrombectomy service increase negatively impacts the Trust response performance and therefore its patients. In order to support the BNSSG Stroke Redesign and the change in services proposed the Trust would require a commitment to recurrent annual funding which will be utilised to mitigate the negative performance impact.

7.2. This report provides a position based on the information known at the time the modelling was completed (June/July 2020). It is expected that during the coming months additional information will be identified which could change the proposed model of the service redesign and the parameters and inputs that have been used in this modelling.

7.3. It has therefore been agreed that before the final business case is produced the BNSSG Stroke Redesign Project Group will re-commission modelling from ORH, to update the impact on the Trust's performance and patients, based on the revised model and/or activity expectations.