Pandemic Influenza Briefing Paper: NHS Surge and Triage

NHS England

08 September 2017

1.0 Purpose

The purpose of this paper is to provide an update to Chief Medical Officer (CMO) and the Chief Scientific Advisor (CSA) on continuing refinement of the knowledge and understanding behind the potential decision that may be required in a future extreme pandemic influenza scenario to move to a state of population triage across the country in response to severe and sustained pressures across the NHS.

Further detail about the operationalisation and implementation of this process is included in the servicefacing draft guidance which is being further developed by NHS England; this paper does not therefore replicate that content.

The majority of the detail in this paper will not be replicated in any publically available documentation and this must be borne in mind when sharing this paper beyond its initial intended audience. This is in part due to the continually evolving nature of such data given the way NHS care is evolving; data could rapidly become less accurate (eg baseline numbers of procedures performed, bed types available etc). As such, the numbers provided should be seen as illustrative and updated figures will be produced as and when required in response to a pandemic.

A number of biological caveats also need to be considered, including the uncertainties around how and when a future pandemic may present, and the population age / risk groups who may be most affected. Additional caveats are set out and explained within the paper where relevant. This paper is current as of July 2017.

2.0 Introduction

In an extreme influenza pandemic scenario, it is expected that NHS services will come under immense pressure, and difficult decisions will be needed about maintaining patient access to care. Work is ongoing at NHS England towards developing guidance for the NHS to enable appropriate frontline decisions about patient care, and that clinicians are supported to do so. This work is underpinned by discussions with ethical, legal and regulatory colleagues, as well as with clinicians and appropriate professional bodies.

This paper is comprised of three main discussions:

- excess deaths at the peak of a pandemic, including a table of highest number/ impact Healthcare Resource Group (HRG) codes for areas associated with services that could be affected
- surge capacity implications during an extreme influenza pandemic scenario
- the potential impacts of suspending various routine activities

It completes with an outline of the expected decision making requirements at national and local level.

There is significant discussion in the paper about ceasing or changing care to patients in the HRG categories; however a decision may more appropriately be taken to treat patients in the listed HRG groups rather than influenza patients, dependent upon likelihood of survival. This is further discussed in the paper and is an example of a feature that will be very much dependent on the pandemic epidemiological profile.

The role of NHS Improvement is not considered in this paper, however discussions are underway to understand their role in preparing for and responding to an influenza pandemic, both in support to the NHS and as a standalone organisation in maintaining their own core functions. Similar discussions have commenced with the regulators.

3.0 Population triage at the peak of the pandemic - potential excess deaths

This section addresses the potential for excess deaths in patients not suffering from pandemic influenza in the peak of a pandemic where normal hospital operations (such as level three care) are unable to be provided. This is the point at which population triage and triage by resource would be required due to the overwhelming demand on hospital services.

Patients would be assessed on probability of survival rather than clinical need, and higher level services would no longer be provided due to the need to redeploy nursing and medical staff to support ward care impacted by increased patient acuity and likely staff shortages. The move to population triage would require ministerial approval and would only be invoked once all capacity in the NHS was exhausted.

The data has been provided by NHS England National Clinical Directors (NCD) and Clinical Reference Group (CRG) Chairs, who were asked to identify the highest number/impact HRG codes for their speciality areas. They were asked to provide current and increased mortality rates if hospital admission was denied or curtailed based on either historical data or, in the absence of this, a clinical best estimate or international data.

Table 1 lists the HRG codes that have been identified as highest number/ impact speciality areas associated with NHS services that could be affected during a pandemic. The excess death rate is indicated in the second column, and the 'life years lost' are calculated using the data in the third column as per the following caveats: assuming approximately a 75 year life span, first child aged 30. The mortality figures are extrapolated from developing world data.

From this, it can be concluded that perinatal/ maternity care plus childhood care being protected would have the greatest benefit and should be maintained as much as is practicable. For most other HRGs, the numbers of life years lost are much lower due to many of them being life-limiting in their own right.

HRG	Baseline deaths per week	Additional deaths per week		Additional life years lost
Perinatal deaths*		1,203	x 75	90,225
Maternal deaths		668	x 45	30,060
Childhood asthma**		304	x 65	19,760
Polytrauma ¹	43	245	x 40	9,800
Pneumonia		317	x 20	6,340
Heart failure ²	2163	3,029	x 2	6,058
Diabetic ketoacidosis		100	x 40	4,000
Myocardial infarction ³	113	169	x 20	3,380
Hip fracture ⁴	115	462	x 5	2,310
Stroke ⁵	185	278	x 5	1,390
Urosepsis		270	x 5	1,350
COPD ⁶	600	553	x 2	1,106
Vascular		105	x 10	1,050
Emergency bowel surgery		103	x 10	1,030

Table 1. Highest ranking/ impact speciality areas that could be affected in a pandemic, with an estimation of the cost of ceasing the service in terms of 'lost years of useful life'

* perinatal deaths is a surrogate term for SCBU and NICU. ** childhood asthma is a surrogate for PICU. ,³ for the UK. 91 baseline deaths and 139 additional deaths for EnglandRare conditions are numerically too

small in number to practically be factored into these considerations.

Immediate survivability of patients in these HRG groups without the usual treatment will vary, and there are differential outcomes in terms of quality of life as well as subsequent life expectancy.

Total excess death rate would be in excess of 7,806 per week of the peak of the pandemic if all these services were stopped. So in the peak six weeks of a pandemic (recognising the typical profile of increasing and decreasing case numbers either side of the peak weeks), 46,836 excess deaths could be expected. On the one hand, this is likely to be an underestimate as it only considers the top 14 HRG codes and it does not take into account additional deaths occurring particularly in the elderly and frail across primary care where HRGs are not coded. However, in practice we would not expect that hospitals to cease all these treatments. These deaths would be in addition to the 500,000 excess deaths from pandemic influenza over the period of a severe pandemic.

4.0 Suspension of activity

4.1 HRG activity suspension

Suspension of some areas of core, routine NHS activity (as outlined in **Table 1**), could potentially, at least in the short term, result in some reduced mortality as patients would not be exposed to the risk of intervention. Cancelling elective day case activity (e.g. gastroscopy) or diagnostics (e.g. radiology) would happen earlier in a pandemic before the extreme surge activities were required. While this may release some resource, it would rapidly be subsumed within local NHS organisational plans to respond to and manage pandemic influenza pressures, and it is not appropriate to analyse specific or individual elective activities to the same degree of detail as the HRG analysis. Potential impacts on morbidity / mortality may occur, and in the short term could be addressed through urgent or acute patient presentations or through medium to long term catch-up screening campaigns etc. after the pandemic ends.

While potentially removing a risk of exposure to influenza in a hospital setting, those patients with the higher risks undergoing elective surgery will largely be the frail and elderly (e.g. orthopaedics) and those with long term conditions (eg cardiovascular surgery); both these groups may be more susceptible to a pandemic virus, or a subsequent secondary bacterial pneumonia.

It is not feasible or, more importantly meaningful, to attribute staff time and/ or resource to each HRG. Whilst the average bed days for a patient with an illness could be calculated based on extrapolating assumed staffing to bed number ratios, this does not in reality reflect the complexity of NHS services (for example how staff may work in different settings during a morning compared to an afternoon, how services are provided differently across the NHS landscape). Furthermore, it may be more appropriate, depending on the pandemic, to redeploy staff who may be released if the patients if these conditions were not admitted to provide supportive care in the community. Each HRG is staffed by a different skill mix within the disciplines of surgery and medicine. It could be argued that medics / medical nurses would have skills sets better aligned to the acute needs of the NHS during a pandemic, but the focus may more appropriately be on those patients needing 'best supportive' care. While suspending HRG activities would release some staff, the bed base will be subsumed into the overall pandemic influenza response and therefore would not necessarily be available for other purposes.

Ceasing any HRG activities would need to be decided in a flexible manner and it is not possible to set out in advance, a pre-defined order in which HRGs would be stepped down or stopped. The local impact of a pandemic on NHS staff and the specific profile of a future pandemic is likely to dictate where demand is likely to overwhelm resource, leading to local decisions which services are most appropriate to continue or cease depending on the age / risk group profile of the most susceptible portions of the population.

4.2 Critical care surge

The baseline NHS capacity for critical care is around 3,500 ventilated beds. Increased demand for critical

care beds above this (nominally by doubling capacity up to 7,000 ventilated beds) can be met through using areas within hospitals that are not usually used for long-term provision of such care (eg theatre recovery areas, operating theatres etc). These services would not be able to be maintained for long periods of time due to restrictions of staffing, consumables, pharmaceutical and physical space resources. In the 2009 pandemic, the NHS estimated critical care capacity could be doubled for up to a maximum of two weeks, though having significant impacts on other services (discussed later in this paper) however this was not necessary in the 2009 pandemic and so has not been tested in action.

The point at which treatments other than simple ventilation, inotropes and fluids are not able to be supported will depend upon what is happening to the staffing in the critical care unit and wider hospital. Areas where critical care is surged into will not be capable of offering higher levels of care than simple ventilation, but until surge is running at about 50% of normal critical care capacity, the main intensive care area might be able to still offer haemofiltration. The trigger point within these surge plans for moving to the withdrawal of permanent ventilation would be when there is no more capacity and increasing numbers of patients present who are likely to require it. This could be nominally set as when bed occupancy is approaching the 6,500 mark of the 7,000 enhanced capacity for ICU beds, however this would in reality need to be regularly reviewed and adjusted to reflect the pandemic profile. Once there are more patients presenting who would normally require ventilation than the surge capacity of the region then no more patients would be offered ventilation. As patients are discharged or die, if the number of patients requiring ventilation continues to exceed maximum surge capacity then critical care staff would be redeployed to ward areas to support higher levels of ward care (see below). If the numbers of patients are overwhelming then it may be necessary to suspend critical care to support the wards, see below.

If critical care was discontinued, it could be expected that approximately 4,800 critical care admissions per week would die resulting in a potential total of 28,800 excess deaths over a six week peak period. Further potential excess deaths due to changing service delivery in a pandemic are set out in the following section. Adding the top 14 HRG code potential excess deaths as outlined in section 3.0, equates to a potential total of 12,606 excess deaths per week and a potential total of 75,636 over a six week peak pandemic period. If excess primary care deaths not otherwise counted are also factored in, this figure could be rounded to 100,000 deaths over a six week period.

Capacity surging of NICU and PICU facilities will take place within wider intensive care surge arrangements, and it is likely that PICU provision maybe maintained for longer than NICU or adult ICU care through redeployment of adult intensivists, as this presents the biggest potential impact in terms of potential life years lost.

4.3 Ward surge

The resources that would be gained from suspending some HRG activities can be simply summarised or calculated as follows:

- each theatre closed would free up a couple of nurses, an anaesthetist and a couple of surgeons
- each out-patient clinic would free up a clinician and possibly a nurse or health care assistant (HCA)

However, the suitability of the staff that are released through this activity to support an influenza response would depend on a number of factors, such as the speciality and whether or not they could be redeployed into other areas of secondary care or community services to bolster capacity. There are also implications for professional regulation and indemnity that need to be addressed, in addition to supporting staff competency and confidence in different roles

Model hospital data indicates that in most general hospitals roughly 50% of the staff/wards are surgical. Therefore, stopping elective surgery at the height of the pandemic would result in a rough doubling of capacity to admit to an acute bed.

Intensive care beds represent a very small percentage of the overall hospital bedstock, but have a proportionally high staffing ratio with an average of six nurses per level three bed and three per level two bed. Therefore ICU beds would contribute relatively little additional bed availability if such provision was ceased, but do have the potential to provide staff to 'prop up' ward staffing if there were significant staff shortages due to sickness.

As an example, a 600 bed hospital would have roughly 12 level three beds and 6 level two beds supported by 90 nursing staff. If it is assumed that an average acute ward has 35 nursing staff to care for 24 to 30 patients, then the ICU staffing of 12 beds equates to staffing for three acute wards. These figures are based on 2014 NICE safe nursing establishment review data¹. These ICU nurses could be used to support surgical ward nurses with sick medical patients. Furthermore, releasing health care assistants into the system early in a pandemic would be of limited use compared to the use they may be able to add in a palliative care scenario, whereas releasing intensive care nurses early in a pandemic would have a more significant impact due to their relevant training.

The pool of staff freed up from theatres is much smaller and they would not have ward nursing experience but could be deployed to medical wards supported by ward nurses. Approximately a third of the nurses in most acute sites are described as 'health care of the elderly', which is essentially acute general medicine. These would remain supporting that care.

4.4 Primary care activities

Initial thoughts around what primary care services could be suspended and those which must be continued are set out in the following table (Table 2). A change in patient health seeking behaviour is likely to see a change in demand for certain treatments, and demand for other primary care services (such as dental and optometry) will diminish significantly, freeing up potential capacity from clinicians. Services in demand may need to be delivered differently, eg through telephone, email or video consultation, through nurse-led services, or provided through creating greater pharmacist autonomy. Finally, support will be required from other sectors as well as an awareness of the whole of health response locally to ensure primary, secondary and social care providers are working in concord and not conflicting each other (eg through primary care continuing to send patients with acute fractures to hospitals, when the acute sector is unable to support this).

Table 2. Primary care suspensions and priorities

Priority to maintain			Could be ceased		
٠	Managing infections, e.g. sepsis, cellulitis, meningitis and influenza	•	All routine Dental / optometry services Management of chronic disease		
•	Acute and urgent illnesses and traumas, e.g. fractures, acute abdominal pain Palliative, pain management and end of life	•	Low level mental health care Learning difficulties Routine diabetes screening		
	care	•	Musculoskeletal care Preventative care (eg vaccination) Dementia diagnosis, old age/ frailty management		

4.5 Activation and Deactivation of Primary and Secondary Care Activities

The following table, **Table 3** outlines activities that could be activated and deactivated in primary and secondary care through an escalation of pandemic influenza surge response. This is further elaborated in

¹ www.nice.org.uk/guidance/sg1/chapter/1-recommendations

Appendix 1. These two tables are taken from the current draft of the NHS England guidance for the NHS on pandemic influenza surge and escalation. Drilling down into any more detail would be counter-intuitive as the flexibility to adjust the response is essential in the face of a pandemic of unknown presentation. At the request of CSA/CMO, a figure has been developed that illustrates the information in the table and relevant points elsewhere in this document (Figure 1).

STAGE	ADDITION		REMOVAL		
	PRIMARY CARE	SECONDARY CARE		PRIMARY CARE	SECONDARY CARE
Steady state	Review plans and	Review plans and			
baseline	processes	processes			
standard	Be prepared to	Be prepared to			
surge	activate surge and	activate surge and			
arrangements	escalation plan	escalation plan			
			\checkmark		
Severe winter	Implement	Implement		Reduce/delay	Reduce/ delay non-
pressure	business continuity	business continuity		non-essential	essential services: eg
surge	arrangements	arrangements		services	outpatient
arrangements	Increased support	Increased support			appointments
	to nursing/care	to nursing/care			
	homes	homes			
			\checkmark		
Mild influenza	Training to enable	Training to enable		Reduce	Reduction in services:
pandemic	staff to undertake	staff to undertake		availability of face	eg orthopaedics,
surge	additional/	additional/		to face	urology and
arrangements	alternate roles	alternate roles		consultations,	gynaecology
(may not need	Collaborate with	Review operational		increasing	Man Active State Control of Contr
all severe	other practices	arrangements		telephone	
winter		within the trust, eg		management.	
actions)		to cohort patients,			
		create flu ED etc			
			1		
Moderate	Identification of	Identification of		Reduction in non-	Reduction in non-
influenza	additional staffing	additional staffing		urgent services	urgent services: eg
pandemic	requirements	requirements			general surgery, ENT
	Urgent referrals on	Urgent referrals on			and vascular surgery
	a 'probable'	a 'probable'			As situation develops -
	diagnosis rather	diagnosis rather			Reduction in services
	than 'likely	than 'posssible'			eg cardiac and cancer
	diagnosis'	Support and			surgery
	Support and	expand end of life			
	expand end of life	facilities			
	facilities				
			\checkmark		
Severe	Undertake triage of	Undertake triage of			
influenza	patients by	community			
pandemic	resource	patients by			
surge	Increased	resource			
arrangements	supportive/	Increased			

Table 3. Activation and Deactivation of Primary and Secondary Care Activities

palliative care

supportive/ palliative care

Consult	Critical	Phase	
with	care		
	capacity	2	
gal, regulators		Severe pandemic	 Cease ventilation Withdraw ventilation Triage commences Maintain maternity, perinatal and childhood as much as possible throughout the whole pandemic
ional bodies, staff, le	7,000 increased capacity reached	Moderate pandemic	 ~6500 critical care beds - decision to move to triage Reduction in non-urgent primary care appointments e.g. routine dental, optometry, diabetes screening, chronic disease management etc. as per Table 2 Reduction in non-urgent secondary care appointments e.g. general surgery, ENT, vascular surgery, gastro, audiology; ten reduce cancer and cardiac surgery
ministers), profession	3,500 business as usual capacity reached	Mild pandemic	 Reduce face to face consultations in primary care, increased phone/ remote management and care Reduced secondary care service, e.g. orthopaedics, urology, gynaecology
ons with DH (SofS,		Severe winter	 Reduce/delay non-essential services in primary and secondary care e.g. some outpatient appointments
Ongoing discussiv etc.		Baseline	Business as usual

Figure 1. Illustrative representation of activities during escalating periods of pandemic influenza surge

The NHS is not uniformly structured, as it has evolved to meet the needs appropriate to local populations. Outpatient services could expect to be ceased, but released resource will look different in different localities (eg some services may be in separate buildings, or held on wards; staffing skill mix will vary, for example many clinics may be supported by HCAs who may not have the appropriate skills to care for influenza patients). Additionally, acute medical clinics will be delivered differently in all trusts, and specialised staff (eg orthopaedic nurses) may not have the competencies to care for respiratory patients. This local variation prevents prescriptive national dictation of exactly what should or could be stopped as the specific local knowledge is key to ensure the most benefit for the most patients. Additionally, a decision may be taken to preferentially treat patients in the listed HRG groups rather than influenza patients, dependent upon likelihood of survival.

At the extreme peak of a pandemic, the over-riding principle may be to only provide supportive care (eg

giving medication, oxygen, fluids, and encouraging oral intake) This is a generic skill and one that most (if not all) staff should have regardless of their usual area of specialty. Specialised care will in all likelihood have been significantly reduced if not completely ceased.

Underpinning principles that could outline the scope for local decision making, based on those discussed with BMA ethics committee and others around doing the greatest good for the greatest number, can be further refined once the epidemiology of the pandemic is known, based on this paper and other resources such as the Committee on Ethical Aspects of Pandemic Influenza (CEAPI) guidance².

5.0 Decision making

The Secretary of State for Health and other Ministers will be asked to decide that population triage can be enacted. This will allow NHS England to allow clinicians in local hospitals to make appropriate decisions about providing care to those patients who will benefit the most in a situation where the system is under extreme and unprecedented pressure.

The request for such a decision will be informed by insight from NHS England, NHS Improvement, the frontline and DH, as well as specialist advisory bodies established in response to a pandemic. Consideration will need to be taken as to whether such a decision is made at England level or nationally across all four UK countries.

Such a decision to move to population triage will effectively be an extension of the usual routine and daily clinical decisions made by clinicians regarding admissions and discharges. However, rather than decisions being made on a basis of triage by clinical outcome, triage by resource availability will also inform the decision. The decision to move to population triage will serve as a trigger to implement changes to the regulatory landscape, allowing the professional regulators to communicate to their registrants any amendments to their code of practice, reflecting the severity of the pandemic. Some decisions will be organisationally enacted by a hospital, for example if a decision is taken to cease all support to particular HRG group.

The Secretary of State for Health will NOT be required to make clinical decisions, decisions about support for specific disease areas, or decisions about individual patients.

Population triage will be enacted for the shortest period possible, and will be regularly reviewed such that it can be ceased as soon as possible.

5.1 Ethics

The ethical aspects underpinning this area are covered by DH published guidance from 2007that was developed by the Committee on Ethical Aspects of Pandemic Influenza (CEAPI). These have been reviewed subsequent to the 2009/10 pandemic and it has been agreed that they remain fit for purpose. In a pandemic, it will be appropriate to review them again, and specific ethical aspects may need to be debated should a more severe pandemic arise than that seen in 2009/10.

5.2 Supporting the response through Legislation and Regulation

The concept of a pandemic influenza bill has been discussed within health and across government. A number of aspects of legislation and regulations are being considered that could be amended during

²http://webarchive.nationalarchives.gov.uk/20100407210045/http://www.dh.gov.uk/en/Publicationsandst atistics/Publications/PublicationsPolicyAndGuidance/DH 080751

pandemic in order to enable a more effective response. These include things around teacher/ carer to child rations, death certification, and regulations around clinicians returning to the NHS after leaving the service for retirement or other reasons.

Localism could be removed from the NHS response to some extent if there was a requirement for staff in one trust to be redeployed to another; for example, if a pandemic wiped out the midwifery department of trust A, the service could be 'propped up' by staff from trust B if the decision was that maternity services should be the last to cease, and such transfer of staff was enabled through legislation and regulation, such as the invocation of section 252a, Health & Social Care Act.

6.0 Next Steps

The development of the clinical facing guidance and associated briefing to DH and central government will continue into 2017. A number of steps are planned towards delivery of guidance that is useful and meaningful for healthcare professionals:

- Continue to refine the service-facing guidance
- Consider whether further ethical engagement is needed through CEAPI
- Socialise further with Academy of Medical Sciences
- Socialise with Presidents of the Royal Societies
- Review again with BMA Ethics committee
- Review with legislators/ regulators
- Review with professional bodies
- Develop appropriate communications as required around this specific piece of guidance

STAGE	PRIMARY CARE	COMMUNITY CARE	SECONDARY CARE	999	111	COMMISSIONERS
Steady state:	-local admission	-local admission and	-local admission and referral criteria apply	-local admission	-local admission	-review plans and
baseline	and referral criteria	referral criteria apply	-review plans and processes	and referral	and referral	processes
standard	apply	-review plans and	-ED redirects on ad hoc basis	criteria apply	criteria apply	-routine monitoring
surge	-review plans and	processes	-use of mutual aid	-review plans and	-review plans and	21.1
arrangements	processes	-be prepared to	-be prepared to activate surge and escalation	processes	processes	
the set	-be prepared to	activate surge and	processes	-be prepared to	-be prepared to	
	activate surge and	escalation processes		activate surge	activate surge	
	escalation		C.	and escalation	and escalation	
	processes			processes	processes	
Severe winter	-comms campaign	-comms campaign to	-increasing requests for redirects, potentially less	-use of REAP,	-additional	-command and control
pressure	to direct patients	direct patients to	frequently granted	DMP and other	staffing	of the system
surge	to 111, developing	111, self-care	-implement business continuity arrangements	escalation plans	-implement	-consider
arrangements	clinical advisory	-reduce/ delay non-	-increased oversight of pressure within	to prioritise calls	specific	redeployment of staff
	service through	essential services	organisation, including through dashboards of	-implement	alternative	(geographically or
	NHS 111,	-implement business	metrics	business	pathways to	service wise)
	encouraging self-	continuity	-comms campaign to direct patients to primary	continuity	respond to call	-increased oversight of
	care, triage.	arrangements	care/ 111	arrangements	types	pressures at local level,
	-reduce/ delay	-potentially patients	-reduce/ delay electives	-promote	-implement	implementation of
	non-essential	in community care	-change outpatient clinic profile: reduce/ delay	alternative care	business	dashboards/ reporting
	services	who would normally	routine/ low priority outpatient clinics, increase	pathways to	continuity	-CCGs hold daily/
	-implement	be admitted (eg	'hot clinics' to address specific areas of demand to	patients	arrangements	weekly calls with
	business continuity	discharged earlier	reduce ED presentations/ admissions	-use alternative	-promote	providers to
	arrangements	than usual)	-reduce/ delay non-essential services	care pathways to	alternative care	understand pressures/
	-potentially	-increased support to	-support from private sector/ voluntary sector	reduce/ adjust	pathways to	mitigation activity
	patients under	nursing/care homes	-national management of ECMO services	demand profile	patients	-NHS England daily/
	primary care who	to reduce admissions	-activation of surge plans	across NHS	-use alternative	weekly calls with CCGs
	would normally be	to secondary care	-step down of critical care patients to other areas		care pathways to	and other local system
	admitted (eg	_0*	of acute care to release capacity		reduce/ adjust	management groups,
	discharged earlier	\O_	-increased support to community care/ nursing/		demand profile	eg system resilience
	than usual)	0	care nomes to maintain in the community		across NHS	groups
	-increased support	dx ~				-consider altering
	to nursing/ care	AV I				commissioning
	nomes to reduce	0				arrangements to
	admissions to	N				increase appropriate
	secondary care					social care spaces
						-increasing use of
						private social and

Appendix 1. Sequential steps for managing surge and escalation in NHS organisations

STAGE	PRIMARY CARE	COMMUNITY CARE	SECONDARY CARE	999	111	COMMISSIONERS
Mild	-decision support	-training to enable	-increased management of patient flow within	-use of pandemic	-use of pandemic	health care capacity -encourage appropriate patients to have pneumococcal vaccination -system command and control implemented
pandemic	staff to undertake	additional/ alternate	-increased repatriation of patients from	ind digoritini	-link to NPFS	-communications to
surge	additional/	roles	respiratory services to DGHs	1		the system and
arrangements	alternate roles		-training to enable staff to undertake additional/	f"		partners
(may not	-primary care		alternate roles			-system intelligence –
need all	services develop		-potentially cohorting patients			data collation through
severe winter	hub / spoke model		-potential increased non-invasive ventilation for			Unify etc. to inform
actions)	to collaborate with		respiratory patients			local/ regional/
	Work					making
	geographically/					-activate pandemic
	remotely with		ξŪ.			specific response
	community / social		X X			arrangements (e.g.
	care teams to		\circ			NPFS/ ACPs)
	target vulnerable.					-enact pandemic flu
	-Develop clinical					plans
	networks to better		X			
	deliver services for					
	Influenza Infected		ON INCOMENTAL OFFICE			
	care / chronic and					
	visits etc	1				
	-Reduction in non-	N.				
	urgent services	~				
	- provide best	20				
	supportive care for	U. C.				
	bereaved /	\sim				
	distressed	\mathcal{O}				
	patients/ families					179 - 179 - 1792 - 1792 - 1792 - 1792 - 1792 - 1792 - 1792 - 1792 - 1792 - 1792 - 1792 - 1792 - 1792 - 1792 - 1
Moderate	-reduction in	-reduction in some	-maintain triage by outcome - use of respiratory	-identification of	-identification of	-authorises activation
Influenza	screening services.	non-urgent services	specific triage-tools where appropriate (e.g. SOFA,	additional	additional statting	of all surge
pandemic	Increased	-increased caring for	CURB-65)-alternative access for patients with	staffing capacity -	capacity - retired/	interventions to be

STAGE	PRIMARY CARE	COMMUNITY CARE	SECONDARY CARE	999	111	COMMISSIONERS
surge	mobilisation of	patients who would	possible/probable influenza avoiding ED unless	retired/ students	students	implemented locally as
arrangements	workforce to care	normally be in	severely ill and requiring sepsis management and		0	needed
	for those ill at	secondary care	resuscitation	· C		-all senior staff to
	home, who would	-identification of	-manage some patients who would normally be	XV		support front end NHS
	normally be in	additional staffing	admitted throughout-patients clinics-maximise	10°		service and patient
	secondary care	capacity – retired/	acute ward capacity	10		flow
	-identification of	students	-all non-essential services (all out-patients	N.		
	additional staffing	-end of life care	including cancer services, rehabilitation and	30		
	capacity – retired/	facilities supported	general medicine) cease on a temporary basis			
	students	and expanded if	-maintain critical services only (eg intra/	1		
	-clinical	possible	peripartum care, lifesaving emergency surgery,			
	management on a	-9409	dialysis			
	'probable'		-identification of additional staffing capacity -			
	diagnosis rather		retired/ students			
	than 'likely		-ECMO escalation implemented			
	diagnosis, reducing		-end of life care facilities supported and expanded			
	requirements for		if possible			
	diagnostics /		-adjusted staff : patient ratios			
	secondary care		-move towards less resource-intensive models of			
	referrals		care/ restrict access to resource-intensive care			
	-end of life care		models			
	facilities supported		-children cared for in adult beds - particularly ICU;			
	and expanded if		patients cared for in DGHs rather than specialist			
	possible		trusts (especially paediatric ICU)			
Severe	-undertake triage	-undertake triage of	-triage by resource rather than by outcome	As above	As above	As above
influenza	of community	community patients -	-provide active critical care treatment for those			
pandemic	patients – by	by resource rather	acutely ill from all conditions irrespective of age,			
surge	resource rather	than by outcome	who are clinically assessed as far as possible			
arrangements	than by outcome	-increased	having a greater than 10% chance of survival			
	-increased	supportive/ palliative	-three wise men discussions			
	supportive/ end of	care	-increased supportive/ palliative care			
	lite care	14	-rigorous exit strategies from critical care/ other			
			admissions			
		\mathcal{O}	-reduction in complex interventions and re-focus			
	2	<u> </u>	on resource low interventions			
	0					

Annex: Pandemic Influenza Patient Triage Scenarios

The patient case scenarios in the table below are examples of the routine cases that clinicians will need to make decisions about providing treatment or admission to in a period of severe influenza pandemic surge. Staff will be required to work under conditions where demand far exceeds resources. Clinical decisions regarding admission will be based on principles of resource triaging, working on a utilitarian principle determining how the greatest number of patients can benefit from the available resource. In this situation there will be a resetting of the expectations of provision of healthcare and recognition that not all patients will receive the level of treatment that they would under non-extreme pandemic circumstances.

The following scenarios provide some narrative about whether the patient is likely to be offered a bed when inpatient resources are severely constrained and with limited intensivity of what can be offered. Where a patient is not admitted, or discharged following only partial treatment, the expectation would be that they would be supported as best as possible in the community, with the priority on providing humanitarian support, analgesia and dignity.

Patient Case Scenario	Notes to consider	Does a scoring system	If not treated in hospital,	Average Length of Stay	Likelihood of being
	during 'resource triage'.	exist (that could be	what resources may be	(ALoS) in hospital if	offered a bed and why?
		adapted) to estimate	required, where might	admitted and resources	
		prognosis on	care be provided, and by	required (e.g. doctors,	
		presentation?	whom?	nurses, theatre, ICU)	
Teenager with Acute	An acute illness which	Scoring systems only	Non-complicated	ALoS: 3-5 days in	Highly likely to be
Appendicitis	left untreated could	exist to predict the	appendicitis can be	uncomplicated case. If	admitted, though with
	result in peritonitis and	presence of	treated with IV antibiotics	complex case could be	early discharge (e.g.
	death within a few days.	appendicitis, not the	but would require regular	as long as 3 weeks. In	within 24hrs) to reduce
		ability to treat	assessment not easily	hospital care – benefits	risk of acquiring
	Significant Life years	patients	delivered in community	from paediatric surgical	infection (e.g. flu). Rapid
	lost	conservatively.	30% of patients treated	experience.	appropriate
		0	conservatively fail,		management offers
			requiring surgery		significant advantage in
		1	9059 - 4045 - 26 - 4055		survival and reduced
	C.	0			morbidity.
72 year old female,	Life years lost limited	Nottingham Hip	Intensive nursing and	ALoS: 14-21 days	Unlikely to be
fallen from a nursing	impact (life expectancy	Fracture Score (NHFS)	carer needs to manage		prioritised for
home bed and likely	could be < 10yrs).	estimates 30-day	patient's pain in bed.	Possible 2 days	admission, although
Fractured Neck of		mortality for patients		inpatient and care back	resources required in
Femur. Carers are in	0	having surgery and		in community.	community to support
attendance.	215	good nursing care.			dignity in end of life
	0	Based on literature			pathway.
		around quality			North AN

		conservative management, mortality with constrained resource > 50% mortality		tion	
30 year old male, Road	Will need theatre time	Estimate survival	Limited conservative	ALoS: following Nail	High mortality
Traffic Accident and a #	but ultimately	probability using the	management available -	insertion NEXT day	untreated (c.f. example
femur in need of a nail	survivable	"Injury Severity Score"	strong analgesia and	discharge is possible.	of Pre WW1>80%
insertion.			Thomas' splints + nursing		mortality)
			care. Risk of severe	~	
			pressure sores within 48		Option to admit for
			hours. NB. Limited		intramedullary nail to
			capacity to teach family		bomo (potentially post
			manage in community		day discharge)
30 year old female	During height of	CURB65 indicative	Home resources may	ALoS: uncomplicated	Likely to be prioritised
healthcare worker,	pandemic no inotropic	patient score 3	include IV antibiotics,	cases 48-72 hours.	based on high death
sepsis (circulatory	support limited value in		(possibly IV Fluids and	In severe pandemic	rate, - decision to admit
infection leading to	going to hospital would	0	Oxygen) but more likely	circumstances if patient	may be influenced by
multi organ failure)	consume bed days.	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	community resources	responds to treatment	estimates of number of
	Definition of sepsis is		limited to oral antibiotics	after 48 hours could	years lost (e.g. older
	not clear, could be	X	 therefore high death 	then be discharged.	patients would not be
	caused as a result of	-C~	rate.	Would need doctor,	admitted)
	pneumonia			nurse	
64 year old male with	A patient without co-	GRACE score is well	Almost all the same drugs	ALoS: uncomplicated	All patients with Non-ST
an acute non-SI	morbidities: it may be	validated for	could in theory if	case: 2-3 days	elevation myocardial
elevation iviyocardial	possible to undergo	assessment of risk	available be given in	Cardiologist, Coronary	Interction are at risk of
with no co-morbiditios	discharge possible	coronary syndrome	community (without	care nurse(s) and	Mi and/or cardiac arrest
with no co-morbialities	discharge possible.	coronary syndrome.	cardiovascular	(cardiologist cardiac	in the acute phase
Versus	Versus		monitoring).	physiologist cath lab	before medical
				nurse(s) and cardiac	treatment has had an
64 year old male with	A patient with co-			radiographer).	impact (mainly first 48
an acute non ST	morbidities , may need			5, 7	hours). These patients
elevation Myocardial	short stay in hospital				would therefore be

Infarction (Heart Attack)	may be deprioritised				considered for
with co-morbidities	and treated at home				admission for 48hrs
	with analgesia and			0	depending on other
	aspirin etc.			O`	competing demands.
Premature baby	If nothing is done, there	APGAR is a descriptor	The 26 week baby needs	ALoS: 8 weeks: of which	Decision not to ventilate
needing ventilatory	is the risk of the patient	of the child's status at	technical support and	1 week or so in NICU,	has to be balanced by
support	not actually dying but	birth. At extremes it is	cannot be treated outside	then mostly HDU or	risk of long term
	surviving with poor	associated with later	of the neonatal unit in	SCBU.	morbidity arising from
	outcomes.	cerebral palsy	hospital.	Care dependant on	postnatal trauma where
		mediated through	G	intensive care support	baby does not succumb
		encephalopathy. No		from fully trained	to illness - admission
		other scoring systems	NO.	neonatal medical and	would depend on local
		help.	·.O-	nursing staff	availability of specialist
				In the absence of	care staff.
			1	ventilator support :	
				<28 weeks old: very few	
			ξO.	would survive, prob 1-	
				15%, versus 90% if there	
		0	<u></u>	is ventilatory support	
		\sim		28-30 weeks old: ~30-	
				40% survive versus 90-	
		×		95% if there is	
		~		ventilatory support	
		Ci		30-32 weeks old: 70-	
		~~~~		80% survive versus 99%	
		2		if there is ventilator	
	-	<u>)</u> .		support.	
				However, this is	
	20			impossible to estimate;	
				the percentages above	
	$\sim$			represent current	
	.0			practice and optimal	
	215			care at delivery - so	
	0			good Level 3 Care on	
				site especially for the	

				highest risk babies. There may be significant long-term complications which were otherwise avoidable with the optimal care.	
Baby born to diabetic mum, 'flat' at birth with a poor APGAR of: i) 3 at 1min ii)7 at 5min	This baby may be OK, would need oxygen through a head box and septic screen - IV antibiotics – but given potential years of life saved would be a patient we would be keen to prioritise (assuming capacity available in NICU)	APGAR (health assessment score covering: Appearance, Pulse, Grimace, Activity, Respiration)	The baby of the diabetic other is probably fine and needs monitoring for blood sugar to avoid acquired brain injury, so with appropriate support and access to best professional advice this could possibly be done in the community	ALoS: <7days probably, perhaps 3-4 Resources: midwife and blood sugar test.	Benefits of admission for support, weighed against risk of acquiring infection from hospital environment. Baby may be safer at home after short admission.
22 year old, mild /	Young patient: in the	CURB65 indicative	Home Resources: IV fluids	ALoS: uncomplicated	Given availability of
moderate asthma,	high risk group for	patient score 3	and antibiotics, and	cases 48-72 hours.	active treatment,
pandemic flu,	pandemic flu.	C C	oxygen. Would need	If patient responds to	admission is likely if the
developing viral			district nursing to	treatment could be	patient demonstrates
pneumonia. Significant	Under age 65, CURB65	X	manage IV and home	discharged in approx. 48	greater benefit in years
respiratory	tends to underestimate,	N°	Oxygen supply	hours with Tamiflu. If	of life saved (e.g.
compromise.	if patient was over 65	0		patient deteriorated,	younger people
	the CURB65 score	~~~		additional intensive	prioritised over older
Versus	would be 4.	1		treatment unlikely to be	patients or younger
22 year old pregnant, mild / moderate asthma, pandemic flu, developing viral pneumonia. Significant respiratory compromise.	draft doc			available and patient likely to be discharged for end of life care.	patients with life limiting long term conditions (e.g. cerebral palsy). A patient is likely to be prioritised for admission if pregnant, as risk of ILI greater but benefit of saving two

The CURB-65 calculator (e.g. <u>http://emcalculator.com/curb</u>) can be used in the emergency department setting to risk stratify a patient's community acquired pneumonia. CURB-65 is fast to compute, requires likely already-available patient information, and provides an excellent risk stratification of community acquired pneumonia. It can facilitate better utilization of resources and treatment initiation. It does not, however, assign points for co-morbid illness and nursing home residence.

* CURB-65 scores:

		No. 1 Pt.
0	Low risk group: 0.6% 30-day mortality.	.67
1	Low risk group: 2.7% 30-day mortality	
2	Moderate risk group: 6.8% 30-day mortality.	C,
3	Severe risk group: 14.0% 30-day mortality.	
4	Highest risk group: 27.8% 30-day mortality.	201
5	Highest risk group: 27.8% 30-day mortality	

Patients who are pregnant and/or obese have higher mortality, this would be useful to consider as part of a 'CURB-65 plus' calculation.

#### **Annex Contributors**

