



The National Pandemic Flu Service

An Evaluation

The NPFS: An Evaluation

DH INFORMATION READER BOX

Policy	Estates Commissioning IM & T Finance Social Care / Partnership Working
HR / Workforce Management Planning / Clinical	
Document Purpose	For Information
Gateway Reference	15652
Title	National Pandemic Flu Service: An Evaluation
Author	Pandemic Influenza Preparedness Team
Publication Date	22 Mar 2011
Target Audience	Supporting Documents for UK Influenza Pandemic Preparedness Strategy
Circulation List	Supporting Documents for UK Influenza Pandemic Preparedness Strategy
Description	Document summarising evaluation of the National Pandemic Flu Service for the 2011 UK Influenza Pandemic Preparedness Strategy
Cross Ref	N/A
Superseded Docs	N/A
Action Required	N/A
Timing	N/A
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For Recipient's Use	

The National Pandemic Flu Service

An Evaluation

Prepared by the Pandemic Influenza Preparedness team. This document was subsequently endorsed by the clinical sub-group of the Pandemic Influenza Clinical and Operational Advisory Group (PICO-CSG).

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Purpose

The National Pandemic Flu Service was used in England during the recent H1N1 swine flu pandemic of 2009/10 and has subsequently been subject to a number of reports and research papers. The purpose of this report is to draw together the key findings and issues from these papers to understand how effective the service was during the H1N1 swine flu pandemic and outline areas where improvements could be considered.

Background

The purpose of the National Pandemic Flu Service (NPFS) is to enable antivirals to be distributed in a controlled and consistent manner to symptomatic individuals during an influenza pandemic. It would only be used at a time when the pressures in primary care have reached the point that a supplementary service is required for the assessment of symptomatic individuals and where appropriate, the authorisation and issuing of antivirals. There will be close monitoring of the number of consultations with GPs during a pandemic to inform this.

The key aims of the service are to:

- Provide antiviral treatment promptly to those who need it
- Reduce the demands on front-line health services by providing a separate route to access and collect antivirals

The NPFS involves an on line and telephony self assessment service where individuals are not assessed by a clinician but follow a process of answering questions which determine whether the person who is ill is eligible for an antiviral or not. It also involves questions about a number of other conditions in order to confirm any further information to be provided as part of the process.

Antiviral collection points are required locally when the NPFS is operating so that friends or relatives (flu friends) can collect the antivirals on behalf of the person with flu, enabling them to stay at home.

It takes at least three weeks for the necessary arrangements to be made for the NPFS to be able to operate. This includes the time required for the systems to be mobilised and for call centre staff to be identified and trained to deal with calls. Therefore, the NPFS would not be operating in the initial stages of the pandemic, but this is in line with the plan that it should only be considered as pressures increase.

NPFS and the H1N1 Flu Pandemic

With the H1N1 outbreak in April 2009, organisations, processes and IT systems were made ready to support the response to the emerging pandemic. The NPFS was mobilised once it was clear that primary care in England was likely to struggle with the combined pressures of both the pandemic and routine health care demand. The NPFS operated between 23rd July 2009 and 11th February 2010, with system authorisations for antivirals being collected up to 18th February 2010. Antiviral Collection Points continued to be used up to the end of March 2011.

Operational Overview

The NPFS provided a wide range of data to inform surveillance at the time of the pandemic. This has been captured and reported on by the Department of Healthⁱ.

During the operation of the NPFS, 2,732,582 assessments were completed which resulted in 1,807,675 authorisations for an antiviral. A total of 1,161,156 courses of antivirals were collected from antiviral collection points having been authorised by the NPFS.

Slightly more female patients were both assessed for (55%) and authorised (54%) antivirals with the peak age band for assessments, authorisations and collections being 25-44 year olds. Of those assessed by NPFS, 31% of patients were referred to their GP whilst 25% were referred to NHS Direct. Most antivirals were collected within 48 hours of authorisation (97.1%), and the service was busiest between 8am and 10am throughout the week with the busiest day being Monday. The web channel was at its busiest on Saturdays and Sundays.

Over the period that NPFS operated, the call centre channel proved slightly more popular than the online version, with 54% of total assessments. The difference in the proportion of collections by patients who contacted NPFS by phone or online is also greater, with 71% of collections by patients who contacted NPFS by phone.

Clinical & Scientific Review

The RCGP Quality Assurance of NPFS

The Royal College of General Practitioners (RCGP) has produced a quality assurance report of the NPFS for the Chief Medical Officer (CMO), highlighting issues and lessons for the futureⁱⁱ.

RCGP was a key stakeholder in the development and operation of aspects of the NPFS. They helped to develop the clinical algorithm and provided assurance and support of the call centre staff through GP liaison advisors during the pandemic response.

Overall, the RCGP report concluded that the NPFS, ‘the first mass application of non-clinical based triage appears to have been a qualified success story’. This reflects the fact that the service successfully met its objectives but with some areas for further consideration which are outlined below (see ‘lessons for future consideration’).

According to the report, the ‘early impression is that the NPFS succeeded in absorbing excess clinical and administrative workload experienced in general practice in England’. It acknowledges that ‘without the NPFS, a large majority of nearly 3 million assessments would have fallen clinically and administratively on GPs, OOH and emergency services’.

RCGP have listed several areas for future consideration in relation to the NPFS which are quoted below. Our current response on these findings is shown in italics:

Assessment & Referral

- ‘A lack of “surge capacity” in existing OOH services makes the NPFS model a useful weapon to have in the NHS arsenal for further emergencies. Future iterations would

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seek to reduce levels of displacement to other services, and address collateral workload issues, such as those relating to sickness certification.'

The clinical algorithm was reviewed and revised during the H1N1 pandemic to further minimise displacement to other services. In the very early stages of a future UK pandemic, the clinical algorithm will also be reviewed and revised if appropriate to ensure it is clinically relevant for the evolving pandemic. Displacement to other services will continue to be minimised but clinical safety will remain a key constraint. Use of the antiviral medicine box (and label with the name of the patient) was considered as a method to indicate that the individual has had the symptoms of flu in the H1N1 pandemic although it is recognised that this would not be a straight forward option. Options to mitigate this issue will be considered for the future.

- 'Clinical incident data could have been gathered more proactively by, for instance, incorporating satisfaction surveys for a proportion of NPFS patients. Patients require more integrated 'safety-netting' around worsening symptoms and clarity as to why they had been referred between services.'

The clinical algorithm contained within the NPFS has a number of questions to ensure that, where appropriate, patients are referred to their GP or specialist for further assessment. During the H1N1 pandemic, improvements were made to the algorithm to enhance clinical safety (such as an additional question to identify malaria) and to ensure that patients are informed of the reason for referral so that there is clarity for both the patient and the GP or specialist. Options to support more integrated 'safety-netting' will be considered for the future.

Antivirals and Access to Them

- 'Differences in treatment protocols between UK countries caused communication difficulties.'

The response to a future UK pandemic needs to be flexible to allow each UK country to respond appropriately but with a common capability. NPFS operates two algorithms which enables decisions to be taken at the time.

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- 'Fears around private antiviral stockpiling seem unfounded, and the inability of the NPFS to issue second courses of antivirals created difficulties.'

The UK has enough antivirals to treat 50% of its population. Allowing patients to access multiple antivirals without seeing a clinician would not offer an appropriate level of control over the national stockpile. For this reason, the NPFS will only enable one antiviral per symptomatic individual.

- 'The impact of antivirals on mortality/morbidity should be reviewed from public health and cost-benefit perspectives.'

A review of the scientific evidence base on the clinical effectiveness of antivirals has been undertaken by the Health Protection Agency in collaboration with the University of Nottingham.

This review found that there is no new data from the H1N1 (2009) pandemic that substantially adds to or contradicts the seasonal evidence base regarding the effect of antiviral drugs on duration of illness or symptoms. However, corroborative evidence is available suggesting that virus shedding (which may be a marker for symptom severity) was reduced by antiviral treatment. In children, there is new observational data suggesting that early treatment reduced the duration of fever.

Regarding complications, data from the 2009 pandemic demonstrate the greater beneficial effect in adults of early (generally within 48 hours) versus late initiation of treatment in terms of reducing the likelihood of hospitalisation, and requiring intensive care. These patients were mainly young, including pregnant women, consistent with the epidemiology of the 2009 pandemic. The same effect was also observed in at-risk adult patients, albeit across fewer studies. A small number of studies suggest that increased in-hospital mortality might be related to the late initiation of antiviral therapy.

This review was endorsed by the Scientific Pandemic Influenza Advisory Committee on 18 November 2010 and will be published alongside the National Pandemic Influenza Strategy.

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- ‘Concerns over low specificity and ‘over-inclusiveness’ of diagnostic indicators may have resulted in a higher threshold for antiviral authorisation by clinicians than via the NPFS.’

There is no current evidence to support the existence of a higher threshold for antiviral authorisation by clinicians than via the NPFS.

Future use of the NPFS

- ‘The use of the NPFS model outside of ‘crisis’ situations must be considered with caution, as at certain levels of circulating flu the liability of such systems can outweigh the benefits.’

The NPFS continues to be a complementary service to primary care and will only be activated if the pressures in primary care warrant additional support during a future UK pandemic. There are no current plans to use the NPFS to support other scenarios although this will be kept under review.

Clinical Incidents during the Operation of NPFS

During the operation of the NPFS, the Department monitored clinical incidents from multiple sources including:

- Patient safety incidents reported to the National Reporting and Learning System (NRLS), managed by the National Patient Safety Agency (NPSA), with further analysis of those in the category of ‘death’, ‘severe harm’ and ‘moderate harm’.
- Weekly feedback from RCGP on issues and potential improvements, whose liaison GPs were attached to NPFS call centres.
- Medicine and Healthcare products Regulatory Agency (MHRA) incidents and ‘yellow cards’ reports on adverse events concerning the anti-influenza medicines Tamiflu and Relenza.
- Other ad-hoc reports such as those received through SHA and PCT Flu Leads, the HPA network, other clinical networks and the public. These clinical networks included organisations such as the Malaria reference laboratory an Advisory Committee, RCGP, DH clinical groups and clinical academia.

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These information streams were collated and initially reportedⁱⁱⁱ on internally in January 2010. An update to this report^{iv} was then produced in March 2010 following the closure of the NPFS. The key observations from the two reports are as follows:

NPSA NRLS - Overview

- 2,410 incidents were reported to the NPSA during the pandemic but only 72 (3%) were related to NPFS
- Of the 186 incidents reviewed by the NPSA, only one (a missed diagnosis causing severe harm) was reported as related to a delay in diagnosis following use of the NPFS.

NPSA NRLS – Deaths & Missed Diagnosis

- Of the 13 deaths reviewed by the NPSA, none were related to NPFS
- In one incident categorised as ‘severe harm’, and mentioning NPFS, a serious diagnosis was delayed because emergency teams assumed the patient’s deterioration was due to influenza-like illness after self-assessment using NPFS.

NPSA NRLS – Incorrect Antiviral Authorisation / Dosage

- During the period when NPFS was in use, the NPSA received 37 reports of problems with antiviral medicines. The main reason for this would appear to relate to questions in the NPFS (clinical algorithm) being answered incorrectly leading to wrong dosage of antiviral medicine being authorised (although in all cases this was picked up at the antiviral collection point). Other issues are varied but include dosing and labelling errors at antiviral collection points and niche issues that caused concern such as one regarding changing symptoms and another regarding possible interactions between antiviral medicine and other prescribed medication.

NHS Feedback

- One SHA was concerned about a delayed diagnosis of a pneumococcal septicaemia which resulted in hospital admission 5 days after the authorisation of Tamiflu by the NPFS. The diagnosis was made when the patient was re-assessed.
- One SHA raised concerns regarding five cases who were subsequently diagnosed with pyelonephritis, lobar pneumonia, legionella and two cases of meningitis one of which was spotted at the Antiviral Collection Point (ACP).

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- A group of patients suffering from Legionnaires disease in one SHA area were reported to have received an original diagnosis of swine flu. The use of NPFS in this diagnosis has not been confirmed.

In all cases, it should be noted that patients were advised to contact their GP if their symptoms did not improve.

Clinical Network Feedback

- Three cases of malaria, initially assessed as influenza-like illness were treated with Tamiflu. These were reported in mid-October 2009 by the Malaria reference laboratory and Advisory Committee on Malaria Prevention but the involvement of the NPFS was not known. Further concerns were expressed about possible delayed diagnosis of malaria by GP members of PICO. Delayed diagnosis of malaria is potentially serious or fatal, and an additional question was added to the algorithm to advise patients at risk of malaria to seek urgent assessment and diagnosis. This complemented existing questions in the clinical algorithm designed to identify conditions such as meningitis and heart disease.
- Through links with the Royal College of General Practitioners and the British Medical Association, we became aware of concerns that some pregnant women were using the NPFS and being authorised Relenza, when they may have asthma or another contra-indicating condition. A new question was therefore included in January 2010 to ensure that pregnant women were authorised the safest antiviral medicine based on their medical condition.
- In the medical literature there has been a paper from a group in Sheffield reporting difficulties or potential diagnostic delays affecting patients who used NPFS. This provided anonymised information to the DH clinical review team. This information confirmed that the cases presented for hospital assessment as advised by the NPFS when their condition deteriorated, and their diagnosis was made on clinical assessment.

Call Centres

- The Royal College of General Practitioners provided liaison advisers who attended call centres to support call handlers and to identify difficulties. In their final report to CMO they observed that the GP liaison group reported excellent training, good practice and

high morale amongst call handlers. In addition, an evaluation of call centre staff experiences has been compiled and is mentioned later in this document.

Emergency Services 999 Referrals

- Early feedback from ambulance 999 Services indicated a high number of inappropriate emergency referrals from NPFS which was due to confusion with regards to a clinical symptom of severe changes in skin colour and circulation. In September 2009, the clinical algorithm was updated so that prior to asking this question, patients were advised that answering yes to either of the two emergency questions would result in a 999 referral. Results were monitored and indicated fewer 999 emergency call handoffs, enabling people to receive appropriate care (reduced from 10.5 % on 09/09/2010 to 6.8% on 17/09/2010).
- The Clinical Assurance Director for NPFS raised a concern that a question in the algorithm regarding skin that was icy cold and wet to touch was contributing to a number of inappropriate 999 hand offs. The Clinical review Group investigated this issue in liaison with the National Chair of Ambulance Medical Directors and Lead of the NHS Ambulance 999 Call Prioritisation Group. Ambulance services reported that the question was not causing a significant problem. Their view was that it was important to identify or exclude cases of shock.

Urgent GP Referrals

- The number of patients classified as requiring an urgent appointment with a GP was felt to be high in the early days of operating the NPFS. RCGP reviewed this with NHS Direct. A question about breathing difficulty seemed to be answered affirmatively in a surprisingly high proportion of cases and was reworded to make it clearer to users. This was implemented in September 2009 and led to referrals reducing from 34.8 % on 09/09/2010 to 29.7% on 17/09/2010.
- The call centre and online script has been updated to ensure that the patient is clear why they are being referred to their GP and a supporting flowchart was developed for GP receptionists.
- The cause of initial symptoms of flu like illness may not initially be clear and may only become apparent at subsequent consultations. A number of actions have been taken mitigate this risk and to ensure that patients are clear that they should contact their GP if their condition deteriorates. Callers are advised to repeat this advice to patients prior to

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the termination of their call and Patient Information leaflets are given to patients on collection of antivirals to reinforce this advice. General Practitioners were reminded by the RCGP that the NPFS was not a diagnostic service and that the cause of a non-specific febrile illness may only become apparent at the second or subsequent consultations in routine clinical practice.

Health Protection Agency Research

An additional study is being undertaken by the Health Protection Agency (HPA), the NPFS and Imperial College London. This is a questionnaire based survey of individuals who took part in the NPFS swabbing scheme. (The earlier NPFS swabbing scheme was aimed at a random sample of one in ten symptomatic individuals where NPFS records showed that an antiviral had been collected. It looked to confirm whether these individuals had the H1N1 pandemic virus or not.)

The objectives of the survey are:

- To estimate what proportion of people who obtained antivirals took them – and what was their adherence, and causes of non-adherence.
- Determine how quickly following symptom onset antiviral treatment was started and determine where delays occurred.
- Determine whether access to NPFS and antivirals was equitable by ethnicity and location.
- Estimate the prevalence of side effects in those who took antivirals.
- Determine the spectrum of disease and disease severity in NPFS users.
- Identify the risk factors associated with disease at a population level.
- Estimate how much pressure was taken off GPs by determining what proportion of NPFS users did not use GPs.

This study is still ongoing and it is likely to be several months before the project is complete. Over 2,600 people have responded to the survey and the outputs from this study will be submitted to a peer-reviewed academic journal for publication.

Public Perception

After the closure of the service in February 2010, the Department of Health commissioned a study through the Central Office of Information (COI)^v. The aim of the study was to determine how effective the NPFS was from a customer's perspective, in order to help identify where the service (or similar services to it) could be improved in the future. Key information from this report is outlined in this section.

The research covered:

- the extent and nature of users' awareness and knowledge of the NPFS prior to contact with it,
- any concerns about contacting the service,
- experience of the assessment and treatment process,
- alternative advice sought either before or after contact with the NPFS, and
- users' overall satisfaction with the service.

The key observations made in this report are as follows:

Satisfaction with the NPFS

- The satisfaction rating for those surveyed regarding the online service was 88%.
- The satisfaction rating for those surveyed regarding the telephone service was 85%.
- 88% of those surveyed said that they would recommend the NPFS to others
- The key dissatisfactions with those surveyed were with:
 - the way in which information was collected (12%) – the main reasons identified relate to the questions being too scripted and formulaic and the desire for a face to face approach, and
 - telephone manner (11%) – the main reasons identified relate to the call handler being unsympathetic / disinterested and not knowledgeable enough.
- When those surveyed were asked an open ended question about what improvements they thought could be made to the NPFS, the two most mentioned points were:
 - medically trained call handlers (8%), and
 - more / more local pick-up points for antivirals (8%).

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However, 51% of those surveyed either felt no improvements were necessary at all or were unable to think of anything specific.

Attitudes Towards Antivirals

- 62% of those surveyed who did not collect antivirals (that they had been authorised) did so because they either felt better or thought they would recover without treatment.
- 23% of those surveyed who did not collect antivirals (that they had been authorised) did so because they were concerned about side effects
- 7% of those surveyed who collected the antiviral medicine but did not start the course of treatment took this action primarily because they:
 - felt better (32%), or
 - were concerned about side-effects (29%).
- 5% of those surveyed who collected the antiviral medicine but did not complete the treatment course took this action primarily because they:
 - were concerned about side-effects (38%), or
 - felt better (34%).

NPFS Awareness & Expectations

- The most effective channel for making those surveyed aware of NPFS was TV news / programmes, where 21% of people first heard of it.
- The most commonly held belief of those surveyed before they contacted NPFS was that it would assess symptoms (27%). 18% of those surveyed thought it would give general information about swine flu.
- The majority (83%) of those surveyed wanted a service that would check their symptoms to see if they had swine flu.

Use of the NPFS

- 63% of those surveyed contacted the service within 48 hours of the onset of symptoms, 90% within 5 days.
- The two main concerns were that the service was:
 - not run by healthcare professionals (5% of the overall sample and 25% of those who had concerns), and
 - that they might be misdiagnosed (5% of the overall sample and 25% of those who had concerns)

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- The three key reasons why those surveyed chose to use the telephone service over the online service was:
 - they thought it would be quicker (22%),
 - it was the only method of contact they knew about (22%), and
 - they wanted to speak to a real person (21%).
- The two key reasons why those surveyed chose to use the online service over the telephone service was:
 - they thought it would be quicker (42%), and
 - they preferred doing things online (35%).
- A fifth of those surveyed used both the online and telephone service primarily because:
 - they were looking for further information (41%), and
 - they wanted to ask questions (28%).

Staff Feedback

During the operation of the NPFS, call handlers were employed to take calls from the public and walk them through the clinical algorithm as appropriate.

A survey evaluating call centre staff experience in delivering the NPFS service was undertaken by NHS Direct between January and February 2010^{vi}.

Overall the NHS Direct report concluded that ‘the respondents viewed their experience of delivering the NPFS with the web-based assessment tool very positively.’ It also noted that ‘the perceptions of the NPFS as a service were very positive. It is evident that the majority of respondents felt that the service that their call centre delivered was appropriate, safe and of high quality.’

The report also felt that ‘overall, the feedback on the quality of the training and ongoing support was extremely positive’.

A number of findings have been highlighted; staff on the whole felt that working with the NPFS had been a very positive experience, the system gave them the confidence to speak to the public and they felt it was a very good way of undertaking an assessment. They also felt that

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the training provided to deliver the service was to a high standard. However a number of staff felt at time it was difficult not to personalise the script when dealing with callers.

The survey made the following suggestions which are quoted below, with the response shown in italics:

The Clinical Algorithm

- 'Work with healthcare professionals to:
 - consider and develop the clinical pathway for children under 1, and
 - prevent a cyclical referral pattern for patients.'

The expert advice is that children under 1 should be seen by their GP and so there is no intention to integrate their assessment into the NPFS. The cyclical referral pattern is hard to eliminate, as primary care might on occasion refer a patient correctly to the NPFS only for them to be referred back to primary care for follow-up assessment.

- 'Work with the public and healthcare professionals in the further refinement of the clinical algorithms to ensure that plain English is used where possible and to explore how to safely introduce an element of personalisation to the assessment process.'

The clinical algorithm has been developed by clinicians including those employed by the Department of Health and those from the Royal College of GPs. We will continue to use internal and external clinical expertise in any future revisions of the clinical algorithm. However, we do need to continue to ensure that language and operational use is consistent to ensure clinical safety.

Clinical Involvement and Support

- 'Give consideration to developing a process that enables call centre staff to transfer patients directly to a dedicated phone-line for clinical advice and support.'

Future plans continue to be based on the provision of clinical support in NPFS call centres via the liaison GPs provided by RCGP, with the call centre operators not being clinically trained. This supports the objective to remove the burden from primary care

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clinicians. To increase the level of clinical staffing would undermine the objective of NPFS and redirect clinicians from dealing with the more serious cases of flu.

- 'Develop the clinical software to:
 - allow for the retrieval of a patient's previous assessment,
 - provide automatic population of the address from the postcode,
 - populate automatic identification of the nearest Antiviral Collection Points from the patient's postcode, and
 - provide Primary Care Trust telephone numbers.'

Aspects of the NPFS have been enhanced to improve usability. This includes an ability to check during the assessment for a valid health record for the patient if required. Further enhancements will be considered for future pandemic preparedness subject to feasibility and funding availability.

Communications & Language

- 'Introduce a simple explanation into the clinical assessment to:
 - explain the purpose of the service,
 - explain the meaning of different assessment outcomes,
 - explain why antiviral medication is authorised for a cluster of symptoms, and
 - explain why there is no confirmation of influenza at the end of the assessment.'

Any explanation needs to be balanced against the increase in time to the overall assessment which might decrease the overall capacity of the service. This will be considered for future pandemic preparedness subject to feasibility and funding availability.

- 'Develop a communication strategy to ensure that the public and healthcare professionals understand the purpose and appropriate use of the NPFS service.'

Communicating the role of the NPFS effectively will be a core part of the communications strategy for any future pandemic where this service is deployed. We undertook extensive evaluation of our communications during the swine flu pandemic and we this will be considered in our pandemic planning for the future.

- 'Ensure that the service is accessible for patients whose first language is not English.'

The online version of the NPFS has been enhanced to offer additional languages – Welsh, Russian, Turkish, Polish and Portuguese.

Financial Appraisal

From a financial perspective, as documented in 'The 2009 Influenza Pandemic: An independent review of the UK response to the 2009 influenza pandemic'^{vii} by Dame Deirdre Hine, DBE FFPH FRCP, the total cost of the distribution infrastructure for preparedness and response was £93.47m. This includes all IT systems (including the NPFS), call centres and other agency costs. Some of these costs would have been incurred if this infrastructure had not been developed and operated such as Health Protection Agency costs. Overall, the cost per patient assessed using this infrastructure appears to be broadly similar to the cost of GP surgery consultation which is £36^{viii}.

Conclusion

This paper has demonstrated the views of multiple stakeholders regarding NPFS via the reports and research that have been undertaken. The performance of the NPFS against its key aims are characterised by its:

- provision of antiviral treatment to 1,161,156 symptomatic individuals, with over 97% of them collected within 48 hours from antiviral collection points
- the completed flu assessment for 2,732,582 patients who might have otherwise gone straight to primary care
- 88% of the public surveyed about their use of the NPFS online service were satisfied, whilst 85% were satisfied with the telephone service

The stakeholders have also identified areas for consideration regarding the future design and operation of the service. These fall into a number of categories:

- Those that have already been implemented to enhance clinical safety and outcomes and to further remove the pressure from the frontline NHS. These include the additional

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clinical question regarding malaria and the rewording of the clinical question on breathing to reduce GP referrals.

- Those that will not be implemented as they are not appropriate such as the integration of the clinical assessment of under 1s into the NPFS (based on clinical advice) and for the call handling script to be personalised and less formulaic as this would introduce clinical risk.
- Those that will be considered for future pandemic preparedness planning or implemented as part of the early mobilisation to a pandemic subject to funding and feasibility, such as providing further context in the NPFS before the start of the clinical questions and providing better integrated 'safety-netting'.

The NPFS was operated in what is recognised as a mild pandemic. However the NPFS is designed to cope with higher online usage and call volumes associated with a more severe pandemic.

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