

## Impact case study (REF3)

<b>Institution:</b> The University of Nottingham		
<b>Unit of Assessment:</b> 3 (Allied Health Professions, Dentistry, Nursing and Pharmacy)		
<b>Title of case study:</b> Increasing patient medicine adherence in chronic illness leading to improved patient health and substantial NHS cost savings.		
<b>Period when the underpinning research was undertaken:</b> 2012 to 2019		
<b>Details of staff conducting the underpinning research from the submitting unit:</b>		
<b>Name(s):</b>	<b>Role(s) (e.g. job title):</b>	<b>Period(s) employed by submitting HEI:</b>
Dr Matthew Boyd	Associate Professor in Patient Safety and Pharmacy Practice	2006 to current
Professor Rachel Elliott	Professor of Medicines and Health	2007 to 2016
<b>Period when the claimed impact occurred:</b> August 2014 onwards		
<b>Is this case study continued from a case study submitted in 2014? No</b>		
<b>1. Summary of the impact</b>		
<p>Research by the School of Pharmacy has been used by the UK Government to improve the nation's public health through enhancing community pharmacy services. The outcome of the New Medicine Service (NMS) review, led by University of Nottingham researchers, underpinned the decision by NHS England to adopt the service delivered by community pharmacists. Between September 2014 and September 2020, over 5,348,000 NMS consultations have been delivered in England to patients starting a new medicine for a chronic condition. Increased medicine adherence afforded by NMS has provided GBP558 million long-term cost savings to the NHS and resulted in 213,952 quality adjusted life years (QALYs) gained. The success of the review and impact within England influenced equivalent services introduced internationally benefitting patients in Norway and Australia.</p>		
<b>2. Underpinning research</b>		
<p>In England, one quarter of the population has a long-term condition, whilst 30% to 50% of medicines prescribed for these conditions are not taken as intended. This leads to medicine wastage, health complications and avoidable hospital admissions estimated to cost the NHS GBP300 million annually (NHS England). Non-adherence is experienced in healthcare systems worldwide, amounting to an estimated cost of USD269 billion (IMS Institute for Healthcare Informatics). It is one of the biggest obstacles to effective healthcare impacting on patients, healthcare professionals, pharmaceutical companies and healthcare systems.</p> <p>The New Medicine Service (NMS) was implemented, initially as a time-limited pilot until March 2013, to improve medicine adherence and outcomes for patients. NMS supports people starting a newly initiated medication for a long-term condition in four patient groups associated with high rates of avoidable hospital admission: asthma/chronic obstructive pulmonary disease (COPD); hypertension; Type-2 diabetes; prescription of an anticoagulant/antiplatelet agent. NMS is delivered by the community pharmacist as an advanced service, either face-to-face or over the telephone.</p> <p>In 2011, the Department of Health invited tenders for a formal academic evaluation of the service to determine whether it should be continued beyond the time-limited pilot. The University of Nottingham, along with UCL (Professor Barber), proposed a high-quality evaluation method and were successful in securing this tender.</p> <p>The study conducted between 2012 and 2014 was led by Professor Rachel Elliott (School of Pharmacy), Dr Matthew Boyd (School of Pharmacy), Professor Justin Waring (Business School) and Professor Nick Barber (UCL) (R1). They performed both an in-depth qualitative appraisal of the implementation, operation and experience of the new services, alongside a randomised controlled trial and economic evaluation across multiple community pharmacy services.</p> <p>46 pharmacies participated in the pilot recruiting 504 patients who presented for a newly-prescribed medicine in one of the four patient groups. They were assigned to either NMS (251) or normal practice (253). Those assigned to the NMS group participated in two consultations – the first 7 to 14 days after presenting to pharmacy and the second 14 to 21 days thereafter.</p>		

Adherence (i.e. patients missing no doses without the intervention of a medical professional) was measured by patient self-assessment questionnaires at Week 10. The results, published in 2014, showed the service is effective at increasing patient adherence to newly prescribed medicines by 10% for chronic conditions compared to normal practice at the time of the study (R2). No increased costs were shown in the short term, and with a likelihood of cost savings in the long term (R3). The Week 26 follow up economic evaluation suggested NMS may continue to deliver the better patient outcomes and the reduced overall healthcare costs compared to normal practice (R4).

An economic study led by Rachel Elliott comparing the cost of delivering NMS with normal practice was published in 2017 (R6). Elliott developed Markov models for the conditions targeted by the NMS to assess the impact of patients' non-adherence. Clinical event probability, treatment pathway, resource use, and costs were extracted from literature review and costing tariffs. Incremental costs and outcomes associated with each disease were incorporated additively into a composite probabilistic model and combined with adherence rates and intervention costs from the trial. The study revealed that NMS has a high probability of cost effectiveness (96.7%) compared with normal practice at a willingness-to-pay of GBP20,000 per QALY. It generated a mean of 0.05 (95% CI 0.00 – 0.13) more QALYs per patient, at a mean reduced long-term cost of GBP-144 (95% CI -769 to 73).

Qualitative research showed how and why the NMS was effective in producing these outcomes, and why there were variations in implementation, by evidencing how the pharmacist interactions changes the attitudes and behaviours of patients with regards to their medicines. Findings showed the implementation of the new service was shaped by the local organisational factors, such as business priorities, and significantly, it evidenced how the NMS offered patients a necessary opportunity to reflect on their medicines use with trained professionals who could offer bespoke guidance for safer and adherent future use (R5,R7).

### 3. References to the research (researchers in **bold** from the School of Pharmacy, UoN)

- R1. **Boyd, M. J.**, Waring, J., Barber, N., Mehta, R., Chuter, A., Avery, A. J., **Salema, N-E.**, Davies, J., **Latif, A.**, **Tanajewski, L.**, and **Elliott, R. A.** Protocol for the NMS Study: a randomised controlled trial and economic evaluation comparing the effectiveness and cost effectiveness of the New Medicines Service in community pharmacies in England. *Trials*. 2013: DOI: 10.1186/1745-6215-14-411
- R2. **Elliott, R. A.**, **Boyd, M. J.**, Waring, J., Barber, N., Mehta, R., Chuter, A., Avery, A., J., **Tanajewski, L.**, Davies, J., **Salema, N-E.**, **Latif, A.**, **Gkountouras, G.**, **Craig, C.**, and **Watmough, D.** Department of Health Policy Research Programme Project report 'Understanding and Appraising the New Medicines Service in the NHS in England (029/0124)' A randomised controlled trial and economic evaluation with qualitative appraisal comparing the effectiveness and cost effectiveness of the New Medicine Service in community pharmacies in England. 14th August 2014 <https://nottingham-repository.worktribe.com/output/1103293/understanding-and-appraising-the-new-medicines-service-in-the-nhs-in-england-0290124>
- R3. **Elliott, R. A.**, **Boyd, M. J.**, **Salema, N-E.**, Davies, J., Barber, N., Mehta, R., **Tanajewski, L.**, Waring, J., **Latif, A.**, **Gkountouras, G.**, Avery, A. J., Chuter, A., **Craig, C.** Supporting adherence for people starting a new medication for a long-term condition through community pharmacies: a pragmatic randomised controlled trial of the New Medicine Service. *BMJ Quality and Safety*. 2015: DOI:10.1136/bmjqs-2015-004400
- R4. Elliott R.A., **Boyd M.J.**, Tanajewski L., *et al* 'New Medicine Service': supporting adherence in people starting a new medication for a long-term condition: 26-week follow-up of a pragmatic randomised controlled trial *BMJ Quality and Safety*. 2019: DOI: 10.1136/bmjqs-2018-009177
- R5. Waring, J., **Latif, A.**, **Boyd, M. J.**, Barber, N., **Elliott, R. A.** Pastoral power in the community pharmacy: a Foucauldian analysis of services to promote patient adherence to new medicine use. *Social Science and Medicine*. 2015: DOI: 10.1016/j.socscimed.2015.11.049

R6. Elliott, R. A., **Tanajewsk, L., Gkountouras, G.**, Avery, A. J., Barber, N., Mehta, R., **Boyd, M. J., Latif, A.**, Chuter, A. and Waring, J. Cost effectiveness of support for people starting a new medication for a long-term condition through community pharmacies: an economic evaluation of the New Medicine Service (NMS) compared with normal practice. *PharmacoEconomics*. 2017: DOI:10.1007/s40273-017-0554-9

R7. **Latif, A.**, Waring, J., Watmough, D., **Boyd, M. J.** and Elliott, R. A. 'I expected just to walk in, get my tablets and then walk out': on framing new community pharmacy services in the English healthcare system. *Sociology of Health & Illness*. 2017: DOI: 10.1111/1467-9566.12739

#### Grants:

R8. "Understanding and Appraising the New Medicines Service in the NHS in England" PI: **Elliot R.A.** Co-Is: **Boyd M.J.**, Chuter A., Mehta R., Avery A., Waring J. and Barber N. PRP NIHR 029/0124 GBP706,964

#### 4. Details of the impact

The health and wealth of the nation has been improved by enabling community pharmacy to reduce non-adherence to medicines. The initial time-limited pilot of NMS between 2011 and 2013 was evaluated by University of Nottingham researchers, the results of which were instrumental to the adoption and funding of the service from 2014 to the present day [A]. This has allowed for the substantial expansion of NMS across England resulting in significant impacts, highlighted below:

##### Policy Impact

The formal academic evaluation of NMS commissioned by the DH was done so with the explicit reason to inform decisions on the longer-term future of the service following the initial pilot. In August 2014, the Chief Executive of the Pharmaceutical Services Negotiating Committee (PSNC) stated that they "*will be using the outcomes of the pilot to inform our ongoing negotiations with NHS employers (who are acting on behalf of NHS England)*". On 22<sup>nd</sup> September 2014, the PSNC announced the finalised Pharmacy Contractual Framework for 2014/15, "*Following the positive outcome of the DH commissioned evaluation of the New Medicine Service, this will continue as an Advanced Service.*" [B]

The expertise of Elliott, Boyd and the wider research team to conduct a high-quality evaluation of the NMS was pivotal for the inclusion of the NMS in the DH budget in 2014/15, without which, the health and economic impacts detailed below would not have been realised.

##### Impact on Health

Over 5,348,000 NMS consultations have been delivered between September 2014 and September 2020 to patients starting new medicines in the four target groups (Table 1). Each consultation for a newly prescribed medicine increases the likelihood of the patient adhering to the medicine by 10%, compared to those not receiving the service, leading to long-term health gain (R1). This is equivalent to an estimated 213,952 Quality Adjusted Life Years (QALY's) saved since September 2014 [0.04 QALY per consultation R4, D].

The NMS review is recognized as an important opportunity to health promotion. For example, the NICE Guidance NG103 highlights where "*People visit community pharmacies for ... a New Medicine Service*" to "*Use every opportunity throughout the flu vaccination season to identify people in eligible groups and offer them the flu vaccination.*" [C]

##### Economic impact

Implementation of the NMS has saved the NHS an estimated GBP558,201,000 in costs since September 2014 [GPB104.36 per consultation R4, D, E].

Table 1 Data on the provision and delivery of the New Medicine Service in England [C, R6]

	Number of consultations	Cumulative Number of Pharmacies claiming payment since launch	% of all community pharmacies*	Modelled cost savings to NHS (GBP)	Modelled Income to Pharmacy (GBP)
Sept 2014/15	461,907	10,968	95.1	48,204,600	11,362,900
2015/16	820,026	11,291	97.9	85,577,900	20,172,600
2016/17	870,358	11,667	101.1	90,830,600	21,410,800
2017/18	926,429	12,036	104.3	96,682,100	22,790,200
2018/19	928,861	12,346	107	96,935,900	22,850,000
2019/20	975,855	12,655	109.7	101,840,200	24,006,000
Sept 2020	365,366	Not Published		38,129,600	8,988,000
<b>Total</b>	<b>5,348,802</b>	<b>-</b>	<b>-</b>	<b>558,201,000</b>	<b>131,580,500</b>

\*Based on total number (11,539) of contracted pharmacies in 18/19 period

### Impact on Pharmacy

NMS participation from pharmacies and patients has increased since September 2014 (Table 1) with 87% of community pharmacies delivering NMS in 2019/2020. Pharmacists are remunerated for delivery of the intervention, which has generated GBP131,580,500 of income for community pharmacy since September 2014 [D, E].

Since the publication of the evaluation, NMS has become embedded within community pharmacy services: In 2016 NMS delivery became a requirement to achieve 'Healthy Living Pharmacy' status - a highly successful scheme to promote public health and wellbeing campaigns through community pharmacy services; in 2017 NMS was announced as one of four gateway criteria for the Pharmacy Quality Payments Scheme; from 2015 NMS episodes are recorded on the medicines optimisation dashboard, as part of the Pharmaceutical Price Regulation Scheme (PPRS)/Medicines Optimisation Programme [F].

Medicines Optimisation and Safety is a key priority in the landmark five-year Community Pharmacy Contractual Framework published in July 2019, and the NMS is highlighted as a key service with expansions into further therapeutic areas to be discussed and agreed in 2021/22 [G]. NMS delivery will continue to be a key gateway criterion for the Pharmacy Quality Scheme highlighting how intrinsically embedded NMS has become within Pharmacy. In September 2020, NMS was outlined as one of seven service requirements for delivery of Structured Medication Reviews (SMR) by Primary Care Networks as part of the Network Contract Directed Enhanced Service [H].

### International impact

This study has been replicated internationally and directly influenced NMS pilot projects and subsequent integration into healthcare systems in Norway and Australia. Detailed below are two such cases:

Australia: UoN researchers advised the Evaluation Officer at the National Prescribing Service (NPS) Medicinewise, Australia between January and December 2016 on the NMS evaluation, specifically sharing study patient questionnaires and advising on optimal data collection methods to be applied to a pilot for an equivalent study in Australia [I]. They state on their website "The

*New Medicine Support Service is adapted from a successful program widely implemented by the NHS England and was cited in a federal budget recommendation in 2017/18.” [J]*

Norway: In 2012, pharmacists from the Norwegian pharmacy organisation, Apokus, visited the UK and PSNC to find out more about the NMS service in England and the planned evaluation by University of Nottingham researchers. Email contact between the CEO of Apokus and Boyd and Elliott following the visit facilitated further exchange of expertise [K]. Following a pilot study in 2015, ‘Medisinstart’, influenced by UK NMS [L], was approved in the budget (NOK4,000,000) for patients with cardiovascular disease starting a new medicine. The service was launched in May 2018, and as of the end of 2018 5,000 consultations had been completed [M].

In summary, research from the University of Nottingham has increased patient medicine adherence in chronic illness and led to improved patient health and substantial cost savings.

## 5. Sources to corroborate the impact

- A. NHS England webpage 30/09/13 detailing NMS extension. URL: <https://www.england.nhs.uk/2013/09/nms/> (accessed 11/02/20 – also PDF).
- B. Statements from PSNC Chief Executive, and Chair PSNC Services Sub Committee on continuation of service linking decision to continue directly to outcome of UoN study, 2014 (from PSNC web site - PDF).
- C. NICE Guidance NG103 URL: [www.nice.org.uk/guidance/ng103/resources/flu-vaccination-increasing-uptake-pdf-66141536272837](http://www.nice.org.uk/guidance/ng103/resources/flu-vaccination-increasing-uptake-pdf-66141536272837) (accessed 20/01/21 – also PDF).
- D. Data from NHS Digital on uptake of NMS by Pharmacy, income to pharmacy and number of consultations 2019/20. URL: <https://www.nhsbsa.nhs.uk/prescription-data/dispensing-data/complete-new-medicine-service-data> and <https://www.nhsbsa.nhs.uk/statistical-collections/general-pharmaceutical-services-england/general-pharmaceutical-services-england-201516-201920> (accessed 06/01/21 – also on file).
- E. UoN report on DHPRP funded NMS evaluation showing cost effectiveness. URL: <https://nottingham-repository.worktribe.com/output/1103293/understanding-and-appraising-the-new-medicines-service-in-the-nhs-in-england-0290124> (also PDF).
- F. Integration within HLP and gateway to payments scheme (from PSNC web site – PDF).
- G. Community Pharmacy Contractual Framework 2019 to 2024. URL: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/819601/cpcf-2019-to-2024.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/819601/cpcf-2019-to-2024.pdf) (also PDF).
- H. NHS England and NHS Improvement (September 2020). URL: <https://www.england.nhs.uk/wp-content/uploads/2020/09/SMR-Spec-Guidance-2020-21-FINAL-.pdf> (also PDF).
- I. Email exchange between Boyd and lead pilot evaluator for NPS (Australia). (PDF).
- J. Webpages detailing service in Australia was based on the UK service and/or Federal budget recommendation in 2017/18, Federal budget 2017/2018 recommending inclusion of NMS and NPS webpage detailing expansion of pilot (PDF).
- K. Email exchange between Boyd, Elliott and Apokus (Norway) (PDF).
- L. International Journal of Pharmacy Practice article with statement of influence of NMS on development of Medisinstart. doi: 10.1111/ijpp.12598 (PDF).
- M. Apotek 2018 annual report. URL: [www.apotek.no/annual-report-2018](http://www.apotek.no/annual-report-2018) (accessed 11/02/20 – also on file) and services. URL: [www.apotek.no/in-english/pharmacy-services](http://www.apotek.no/in-english/pharmacy-services) (accessed 24/08/20 – also PDF).