

<b>Institution:</b> The University of Nottingham		
<b>Unit of Assessment:</b> 17 – Business & Management Studies		
<b>Title of case study:</b> Improving medicines adherence in chronic illness		
<b>Period when the underpinning research was undertaken:</b> 2013-2019		
<b>Details of staff conducting the underpinning research from the submitting unit:</b>		
<b>Name(s):</b> Professor Justin Waring	<b>Role(s) (e.g. job title):</b> Professor	<b>Period(s) employed by submitting HEI:</b> 2012 – 2019
<b>Period when the claimed impact occurred:</b> August 2014 onwards		
<b>Is this case study continued from a case study submitted in 2014?</b> N		
<b>1. Summary of the impact</b>		
<p>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 GBP558,000,000 long-term cost savings to the NHS and 213,952 quality adjusted life years (QALYs) gained. The study's success and impact within England influenced equivalent services introduced internationally and therefore benefitting patients' health in Europe 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 GBP300,000,000 annually [<a href="https://bit.ly/2TEoXEK">https://bit.ly/2TEoXEK</a> accessed 21/01/2020]. Therefore, the New Medicine Service (NMS) was implemented by the NHS as a time-limited service, commissioned 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, or prescription of an anticoagulant/ antiplatelet agent).</p> <p>The future of the service was to be determined by a formal academic evaluation of the 2011 to 2013 pilot funded by the Department of Health Policy Research Programme (DHPRP). In 2011, The University of Nottingham, along with University College London, proposed a high-quality evaluation method that secured the competitive tender to evaluate the clinical and cost effectiveness of the service. The study, conducted between 2012 and 2014, followed a mixed methodology approach from the Nottingham University Business School and the School of Pharmacy by performing 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 [1].</p> <p>504 patients who presented for a newly prescribed medicine in one of the four patient groups were recruited from 46 pharmacies. They were assigned to either NMS (251) or normal practice (253) and participated in two consultations, the first 7-14 days and the second 14 to 21 days after first presenting to pharmacy. Adherence (patients missing no doses without the help of a medical professional) was measured by patient self-assessment questionnaires at week 10. Results showed that the service is effective at increasing patient adherence to newly prescribed medicines by 10% for chronic conditions compared to standard practice at the time of the study [1]. Additionally, an economic study, comparing the cost of delivering NMS with normal practice, developed Markov models for diseases targeted by the NMS to assess the impact of patient's 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-</p>		

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) [4].

The qualitative implementation study showed how and why the NMS was effective in producing these outcomes, or why there were variations in implementation, by evidencing how the pharmacist interactions changes the attitudes and behaviours of patients with regards to their medicines. As such, it demonstrated the causal mechanisms underlying the observed outcomes. This research was carried out with 23 of the 61 community pharmacies involved in the quantitative trial, reflecting differences in ownership and location. In these sites, the study involved observations of day-to-day practice, focused observations of the delivery of the NMS, and post-intervention interviews with both pharmacists and patients. In total, 20 patients experiencing the NMS were followed through the service, and 13 patients receiving standard practice were interviewed. Findings showed the implementation of the new service was shaped by 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. Furthermore, it showed how patient understanding and behaviour change is shaped by the relational practices of pharmacists. This qualitative evidence substantiates and elaborates the findings of the quantitative trail and economic evaluation [3, 5, 6].

The study ultimately recommended the continued and extended implementation of the NMS and also identified key variations in adaption and use according to pharmacy business model (corporate or SME), staff and workforce configuration and spatial factors. It also made recommendations for the future training of professionals to better engage and work with patients [7].

### 3. References to the research

#### Publications

1. 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., Gkoutouras, G., Craig, C., and Watmough, D. 2014. "Department of Health Policy Research Programme Project: Understanding and Appraising the New Medicines Service in the NHS in England (029/0124)" [www.nmsevaluation.org.uk](http://www.nmsevaluation.org.uk)
2. Elliott, R. A., Boyd, M. J., Salema, N-E., Davies, J., Barber, N., Mehta, R., Tanajewski, L., **Waring, J.**, Latif, A., Gkoutouras, G., Avery, A. J., Chuter, A., Craig, C., 2016. "Effectiveness of the New Medicine Service in community pharmacies in England", *BMJ Quality and Safety*, 25, 747-758. <https://doi.org/10.1136/bmjqs-2015-004400>
3. **Waring, J.**, Latif, A., Boyd, M. J., Barber, N., Elliott, R. A. 2016. "Pastoral power in the community pharmacy: a Foucauldian analysis of services to promote patient adherence to new medicine use" *Social Science and Medicine*, 148, 123-130 <https://doi.org/10.1016/j.socscimed.2015.11.049>
4. Elliot, R.A., Tanajewsk, L., Gkoutouras, G., Avery, A.J., Barber, N., Mehta, R., Boyd, M.J., Latif, A., Chuter, A. and **Waring, J.**, 2017. "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*, 35:12, 1237-1255, <https://doi.org/10.1007/s40273-017-0554-9>
5. Latif, A., **Waring, J.**, Watough, D., Boyd, M. J. and Elliott, R. A. 2018. "‘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*, 40:6, 1019 -1036. <https://doi.org/10.1111/1467-9566.12739>
6. **Waring, J.** and Latif, A. 2018. "Of Shepherds, Sheep and Sheepdogs: governing the adherent self through complementary and competing pastorates" *Sociology*, 52:5, 1069-86 <https://doi.org/10.1177%2F0038038517690680>

7. Latif, A., **Waring, J.**, Watmough, D., Barber, N., Chuter, A., Davies, J., Salema, N., Boyd, M., Elliott, R.. 2016. "Examination of England's New Medicine Service (NMS) of complex health care interventions in community pharmacy" *Research in Social and Administrative Pharmacy*, 12:6, 966-989. <https://doi.org/10.1016/j.sapharm.2015.12.007>

**Grant details:**

<i>Funding body</i>	<i>Investigators</i>	<i>Title</i>	<i>Dates</i>	<i>Amount</i>
National Institute for Health Research	Prof. R. Elliott, Dr M. Boyd, Mr A. Chuter, Mr R. Mehta, Prof. A. Avery, <b>Prof J. Waring</b> , Prof N. Barber	Understanding and Appraising the New Medicines Service in the NHS in England	Jan 2012 – Feb 2014	GBP706,964

**4. Details of the impact**

The initial time-limited pilot of NMS between 2011 and 2013 was evaluated by University of Nottingham researchers and ultimately led to the adoption and funding of the service from 2014 to present day [A]. Therefore, research conducted at the University of Nottingham directly contributed to NMS' establishment and its substantial expansion across England including new, significant impacts which are highlighted below.

**Policy Impact**

The formal academic evaluation of NMS, commissioned by the Department of Health and Social Care (DHSC), was done so with the explicit reason to inform decisions on the longer-term future of the service following the initial pilot. This is evidenced by the Pharmaceutical Services Negotiating Committee (PSNC) Chief executive statement, in August 2014, that the PSNC 'will be using the outcomes to inform our ongoing negotiations with NHS employers (who are acting on behalf of NHS England)' and, on 22<sup>nd</sup> September 2014, the PSNC announced the finalised Pharmacy contractual framework for 2014/15, which included NMS as an advanced service including the explicit reference to UoN research - 'following the positive outcome of the DH commissioned evaluation of the New Medicine Service, this will continue as an advanced service' [B]. Therefore, the expertise of Waring, and the wider research team, to conduct a high-quality evaluation of the NMS was pivotal for the inclusion of the NMS in the DHSC budget in 2014/15. Without which, the health and economic impacts detailed below would not have been realised.

**Impact on Health**

Over 4,500,000 NMS consultations have been delivered since September 2014 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. This is equivalent to an estimated 160,000 Quality Adjusted Life Years (QALY's) saved since September 2014.

**Economic impact**

The implementation of the NMS, which was informed by UoN research [1], has saved the NHS an estimated GBP558,201,000 since September 2014 [D, E].

(Table 1) *Data on the provision and delivery of the New Medicine Service in England* [C]

	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

## Impact case study (REF3)

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 [C, D].

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' (HLP) Level 1 status, a highly successful scheme to promote health and well-being campaigns through community pharmacy services, which, in February 2019, 9,535 pharmacies in England declared that they were HLP Level 1 [E, pp. 14, 18]. Furthermore, from 2020/21 community pharmacy contractors will be required to become an HLP Level 1 as agreed in the Community Pharmacy Contractual Framework: 2019-2024 [E, p. 18]. Additionally, in 2017, NMS was announced as one of four gateway criteria for the pharmacy quality payments scheme [E, pp. 22, 23].

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

### International Impact

The UoN study has been replicated internationally and directly influenced NMS pilot projects and subsequent integration into healthcare systems in Australia and Norway. Firstly, the success of the NMS influenced Australia's National Prescribing Service (NPS) Medicinewise to conduct an equivalent study in Australia which led to the implementation of Australia's own New Medicine Support Service. The influence of UoN research on the establishment of NPS Medicinewise is evidenced by researchers advice to the Evaluation Officer at NPS Medicinewise between January to 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 [H]. Additionally, The Society of Hospital Pharmacists of Australia Federal Budget for 2017-18 cites [1] and recommends funding 'a pilot of a hospital-directed liaison service aligned with UK's New Medicines Service' [I, p. 4]. Furthermore, they state on their website that '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 [I, p. 12].

Secondly, NMS's success in the UK influenced a similar service, Medicinstart, to be launched in Norwegian pharmacies. In 2012, pharmacists from the Norwegian pharmacy organisation, Apokus, visited the UK and PCNS to find out more about the NMS and the planned evaluation by University of Nottingham researchers. Email contact between the CEO of Apokus and the University of Nottingham, following the visit, allowed further exchange of expertise [J, pp. 23-6]. The influence of University of Nottingham research upon Norway's service is evidenced by an

## Impact case study (REF3)

evaluation of Medicinstart which draws specific attention to the findings of [1] 'on patient adherence, along with reduced cost for the healthcare system' and summarises that 'influenced by the NMS, a similar intervention named Medisinstart was developed in Norway' [J, p. 14, 21]. In 2018, Medicinstart was approved in the Norwegian budget (4 million Norwegian NOK) for patients with cardiovascular disease starting a new medicine [J, p. 22]. In May 2018, the service was launched and, as of the end of 2018, 5000 consultations had been completed [J, p. 5].

**5. Sources to corroborate the impact**

- A. NHS England [webpage](#) detailing that NMS between 2011 and 2013 was a pilot and the Nottingham led evaluation was instrumental in deciding its future in the NHS
- B. Collated evidence: PSNC official NMS enquiry (quotes on continuation of service linking decision directly to outcome of UoN study)
- C. Data from NHS Digital on uptake of NMS ([Source 1](#) and [Source 2](#))
- D. UoN [Report](#) of study for DHPRP which evidences cost effectiveness of the service
- E. Collated evidence: Community Pharmacy Services (Public Health England report 'Healthy Living Pharmacy Level 1 Quality Criteria', PSNC webpage declaring that from 2020/21 community pharmacy contractors will be required to become an HLP Level 1, April 2017 NHS data demonstrating that NMS was one of the 4 gateway criteria and PSNC briefing on the Pharmacy Quality Scheme 2019/20)
- F. Community Pharmacy Contractual [Framework](#) 2019 to 2024
- G. NHS Structured medication reviews and medicines optimisation: guidance, p. 11
- H. Email exchange between UoN researchers and the lead pilot evaluator for NPS
- I. Collated evidence: Australian impacts (The Society of Hospital Pharmacists of Australia Federal Budget 2017-18, Australian government press release, NPS webpages stating the Australian service was based on the UK service and detailing expansion of pilot)
- J. Collated evidence: Norwegian impacts (Apotek 2018 annual report, evaluation of Medicinstart doi: 10.1111/ijpp.12598, webpage of Apotek announcement, email exchange between the CEO of Apokus and UoN)