King's Research Portal

DOI:

[10.1016/j.ienj.2019.04.003](https://doi.org/10.1016/j.ienj.2019.04.003)

Document Version

Peer reviewed version

[Link to publication record in King's Research Portal](#)

Citation for published version (APA):

Pickstone, N., & Lee, G. A. (2019). Does the @home team reduce local Emergency Department attendances? The experience of one London service. *International emergency nursing*, 46, [100774].
<https://doi.org/10.1016/j.ienj.2019.04.003>

Citing this paper

Please note that where the full-text provided on King's Research Portal is the Author Accepted Manuscript or Post-Print version this may differ from the final Published version. If citing, it is advised that you check and use the publisher's definitive version for pagination, volume/issue, and date of publication details. And where the final published version is provided on the Research Portal, if citing you are again advised to check the publisher's website for any subsequent corrections.

General rights

Copyright and moral rights for the publications made accessible in the Research Portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognize and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the Research Portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the Research Portal

Take down policy

If you believe that this document breaches copyright please contact librarypure@kcl.ac.uk providing details, and we will remove access to the work immediately and investigate your claim.

Does the @home team reduce local Emergency Department attendances? The experience of one London service

Abstract

Background: Since 2014, the @home team has been offering patients acute care in their own homes using a multi-disciplinary team with the aim of preventing some Emergency Department (ED) attendances, facilitating early discharges, and preventing acute admissions. By preventing some ED attendances, the @home team aims to contribute to the performance of the two local EDs, both of which are currently failing to meet the ED 4-hour operational target.

Objectives: To determine if the @home team reduces ED attendances locally, and if so, by how much, and whether this impacted on the 4-hour operational target.

Methods: The number of @home referrals that were prevented from attending either St Thomas's or King's College Hospital EDs was audited using a specially developed audit tool and spatial analysis performed, mapping the home locations of patients referred, and using 'nearest neighbour analysis' to determine the number and percentage of @home referrals prevented from attending the two local EDs.

Results: A total of 1084 patients were referred to the @home team in a 3-month period with 755 (72%) referrals accepted. Using Geo-codable data, 387 local ED attendances were prevented (298 from King's College Hospital and 89 from St Thomas's Hospital ED). Over the same time period, King's College Hospital had 71,688 ED attendances and St Thomas's ED had 48,030 attendances.

Conclusions: Although the @home team reduces a small number of ED attendances each month (1 in 300), this number is not high enough to make a significant impact on average performance against the 4-hour target at the local EDs alone.

Keywords:

@home team, hospital at home, Emergency Department, 4-hour wait, performance, overcrowding

1 **Introduction**

2

3 The Emergency Department (ED) is the gateway through which the majority of patients are
4 admitted into the hospital setting (Fry et al., 2018). Currently there are many challenges for
5 EDs including increasing patient attendances, an ageing population with more complex health
6 needs, and a depleted workforce with a widespread shortage of emergency medical trainees,
7 senior emergency doctors, and nurses at all levels (Hunt 2016, Cowling et al 2014). In the UK,
8 there is a target that 95% of all ED patients should be seen, treated, admitted or discharged
9 within a 4-hour period but this is currently sub-optimal with only 85.1% of UK EDs are
10 achieving this target (Evans et al 2017, NHS England 2017) with 2.5 million patients in England
11 waiting more than 4 hours in 2017 (Murray et al 2017). In an attempt to relieve pressure on
12 EDs and achieve the 4-hour operational targets, many new initiatives have been developed
13 including the introduction of an accredited Emergency Care Practitioner's role by the Royal
14 College of Emergency Medicine and Health Education England, and the introduction of
15 General Practitioners or senior nurses streaming patients at the front door of EDs (Evans 2017,
16 Ham, 2015).

17 Data suggests that a large proportion of ED presentations could actually be treated or cared
18 for by primary care services or by self-care (Cowling et al 2014). They also found that 47% of
19 ED attendances in England and Wales in 2012-2013 were discharged without needing
20 treatment, or just needing advice. The @home team aims to relieve some of the pressures on
21 the hospital inpatient setting by preventing the need for an admission by 'bringing the hospital
22 to the patient' by offering a care pathway similar to that of the acute setting and aims to
23 reduce ED attendances, prevent hospital admissions, and support advanced (early) discharge
24 (Lee and Titchner 2016).

25 The literature on hospital in the home has shown positive results in terms of patient
26 satisfaction, lower mortality rates, lower readmission rates and avoiding hospital admission
27 from studies in Australia, New Zealand, Italy and the UK (Facultad & Lee 2019; Lee et al., 2017;
28 Lee and Titchener 2015; Varney et al., 2014; Montalto et al., 2010a; Shepperd et al., 2009;
29 Wilson et al., 2003). In Victoria, Australia, 32,462 patients were admitted into the hospital at
30 home service, representing 2.5% of all the inpatient admissions for the state and has
31 significantly increased the overall capacity of the hospital system (Montalto 2010b). Also in
32 Australia, Varney et al. (2014) performed an integrative review of 22 articles to assess the
33 efficacy of admission avoidance specifically within the Hospital In the Home (HIH) services

34 concluded that recruiting (admitting) patients straight from the ED into HH services is cost
35 effective, equates to higher patient satisfaction, yet found no effect on clinical outcomes or
36 rates of adverse reactions following on from admission to the service. Despite these studies,
37 there is little evidence of cost-effectiveness. From the UK perspective, Imison et al. (2017)
38 critically states that there is little robust evidence that hospital at home services deliver net
39 savings and argue that further cost analysis is needed. The following section outlines the
40 service offered by the @home team.

41 **Description of @home service**

42 The @home team is based in south east London, covering the London Boroughs of Lambeth
43 and Southwark. The term 'locally' therefore refers to Lambeth and Southwark. In 2016,
44 Lambeth had a registered population of almost a third of a million people, 318,000 (Lambeth
45 Government website, 2017) and Southwark has a population of 288,283 (Southwark
46 Government website, 2016). Owing to a growing population and service demand, an extra
47 200,000 primary care appointments were created by service expansion over the total 8
48 boroughs of south east London, but this seems has had little real impact locally in terms of
49 meeting pressures for healthcare services (NHS 2016). From the perspective of this audit, the
50 @home team only covers residents with a registered GP in Lambeth or Southwark, providing
51 care in the patient's usual place of residency (i.e. their own home, nursing/residential care
52 home or residential hostel). Occasionally, if a GP is registered as Lambeth or Southwark, but
53 the patient lives on the borders or edge of the ward, care can then be delivered, but a
54 registered Lambeth or Southwark GP is necessary, or the service cannot access funding.
55 Currently, the @home team offer 25 clinical pathways, with more being developed. The staff
56 working within the @home team consists of contracted General Practitioners, Matrons,
57 Clinical Nurse Practitioners, Staff Nurses, Physiotherapists, Occupational Therapists, and
58 clinical support staff. The @home team are supported by admin staff and a business manager.
59 The Matron leads the team, and holds clinical accountability and geriatricians attend for six
60 sessions per week to offer medical guidance. Two Social Workers are commissioned to work
61 for a number of hours per week within the service. The consultants led by the Matrons
62 perform virtual ward rounds and are also available to do home visits or Comprehensive
63 Geriatric Reviews. The team is diverse and offers varied clinical expertise to ensure that the
64 patient receives a holistic care plan and treatment package. With access to hospital
65 diagnostics, the patient's journey should mirror that of the hospital, except that it is delivered
66 within their own home rather than in an acute setting. The service's working hours are 8am

67 until 11pm, 7 days a week including bank holidays. SELDOC (South East London Doctor On
68 Call), the local out of hours GP service, has the contract to provide care outside of 8am –
69 11pm. Patients' clinical notes are documented both within the place of residence (with a copy
70 remaining until the episode of care has completed) and on a shared (confidential) IT system.
71 Other community staff in Lambeth and Southwark, such as, District Nurses, Podiatrists,
72 Dieticians etc have access to the IT system: Care-Notes, so therefore can read what care the
73 @home team is delivering. This also reduces duplication of care.

74 Alongside early hospital discharge and admission avoidance, the @home team also offers an
75 alternative to ED attendances. For example, a patient who has been seen by a GP, who may
76 require intravenous antibiotics can be commenced and monitored in their home by the team,
77 rather than follow the more traditional route of presenting at ED with a GP referral for an
78 admission. Thus the @home service aims to reduce local ED and hospital attendances, as well
79 as hospital bed days.

80 Given this, the aim of this paper was to establish if the @home team contributes to the
81 reduction of ED attendances at the local emergency departments and has an impact on the 4-
82 hour operational targets in EDs.

83 **Methods**

84

85 ***Study setting & participants***

86

87 The @home team is based in south east London, covering the London Boroughs of Lambeth
88 and Southwark. The term 'locally' therefore refers to Lambeth and Southwark. In 2016,
89 Lambeth had a registered population of almost a third of a million people, 318,000. This is 4%
90 of the 8 million people living in London (Lambeth Government website, 2017). Southwark has
91 a slightly smaller population of 288,283 (Southwark Government website, 2016). As with most
92 London boroughs, there is a diverse range of socio-economic statuses. Owing to a growing
93 population and service demand, an extra 200,000 primary care appointments were created by
94 service expansion over the total 8 boroughs of south east London, but this seems has had little
95 real impact locally in terms of meeting pressures for healthcare services (NHS 2016). The
96 @home team was commissioned in response to the benefit of transferring hospital care into
97 the home and relieve the pressure on the local EDs. The service is provided by Guy's and St
98 Thomas's NHS Trust (GSTT) and commissioned by the Lambeth and Southwark Clinical
99 Commissioning Groups (CCGs). Although it is a GSTT run service, following on from a recent

100 Trust-wide care, collaboration and information sharing IT programme, the team have access to
101 King's College Hospital (KCH) clinical records and ordering portals (Blood tests, X-rays etc).
102 Geriatricians from both Trusts provide clinical input, advice and patient contact time. The
103 majority of referrals accepted are for patients whose local hospital is either St Thomas's
104 Hospital (Guys and St Thomas's Trust) or King's College Hospital (King's College Hospital Trust).

106 ***Ethics***

107 As the Trust deem this an evaluation of a service, ethics approval was not required. Although
108 the Trust is mentioned, as this is necessary for the audit purpose, the confidentiality of both
109 patients and staff members has been respected in accordance with the Nursing and Midwifery
110 Council (2015).

111 ***Study Design***

112 This audit reviewed the referral data of the @home team and the two local NHS Trust ED
113 attendances over a 3-month period, from September 2016 to November 2016, inclusive. These
114 data were evaluated in order to capture the number of ED attendances reduced/prevented by
115 the @home team. An audit tool was devised in order to address the research question and
116 using this, each @home referral was checked to see if that patient fitted the criteria of a
117 patient who would have attended ED if not seen by the @home team. The @home team takes
118 referrals from both the acute settings (both hospitals to initiate early discharge), from
119 community services (to avoid hospital admission) and London Ambulance Service (to avoid ED
120 attendance for example). These audited referrals were then inputted into Geographical
121 Information System (GIS) software, MapInfo, and geocoded using postcodes, in order to assess
122 their relative proximity to the EDs at King's College Hospital and St Thomas's Hospitals. This
123 resulted in a numerical figure of the reductions in attendances per ED and related NHS Trust.

124 ***Data collection***

125 Data were collected from Department of Health published and public records regarding the ED
126 performance of both St Thomas's ED and King's College Hospital ED. These data are within the
127 public domain. In order to establish the audit question, the @home referrals within a 3-month
128 period were reviewed. Each referral was then measured against an ED prevention audit tool,
129 allowing a second set of numerical data to be sought. The total accepted referrals were then
130 mapped against their postcodes. This mapping exercise was to establish which ED the @home
131 service impacted on most, either St Thomas' Hospital or King's College Hospital. This gave

132 further numerical figures of the assumed reductions in attendances per trust. This was then
133 divided by the overall ED attendance figures with a calculation being made as to whether or
134 not a significant reduction in attendances was made on overall ED performance.

135 ***Collection Stages***

136 Phase 1 of the process was to collect and review all the referrals made to the @home team
137 from September 2016 to November 2016. These data then needed to be filtered with any
138 identifiable data and irrelevant data being eliminated (Morrell and Harvey 2005). This was
139 done through accessing the shared local care record, Care-notes. Care-notes is used by all
140 community staff in Lambeth and Southwark. To use this programme staff must have both
141 been trained and have an individual password. Importantly when staff access Care-notes, they
142 leave a traceable digital footprint. This is useful for audit purposes and to ensure quality
143 control of clinical records.

144 Care-notes holds all the data for each patient referred to the @home team. Each patient's
145 referral for each @home episode was first obtained. Identifiably data such as names, NHS
146 numbers and GP details were deleted as not relevant to capture the data needed for this audit
147 and to maintain patient confidentiality. Once the appropriate data had been retrieved, it was
148 then inputted into Microsoft Excel. Once in Excel the data was kept on a password only access
149 laptop, again with confidentiality being maintained.

150 Phase 2, was to create the ED prevention tool (**Supplementary table 1**). This tool was used to
151 filter all the referrals, to ensure that the most appropriate and relevant information was
152 collected. No comparable tools are available and therefore clinical judgement was used to
153 devise the tool.

154 ***Insert Table 1 here***

155 The 3rd phase was to collect NHS England published performance figures for the same
156 timeframe (September 2016-November 2016). EDs have a statutory duty to report these
157 attendance figures, their adherence to the 4-hour operational target, and the percentage this
158 deems their performance at, this is a requirement by NHS England. Such data are published
159 within the public domain. Once all the relevant data were captured, this information was then
160 inputted into Excel and further analysed.

161 The final part of the data collection was to map the postcodes of each address of each referral
162 made against the postcodes of the two hospitals. This resulted in a numerical breakdown,
163 dependent on proximity to each hospital, of the number of attendances prevented for each

164 trust. In order to attempt to determine which ED the patients would have attended; a
165 mapping exercise was performed using MapInfo Geographical Information System (GIS)
166 software. According to Musa et al (2013), such systems are being applied more frequently in
167 healthcare research. The audited referrals were geo-coded by matching their postcodes
168 against those found in the Office of National Statistics Postcode Directory (ONSPD). The
169 ONSPD file contains longitudes and latitudes for geo-coding, this is defined in basic terms as
170 the creation of points on a map (Phillips et al 2000). The same process was then used to geo-
171 code the postcodes of St Thomas's Hospital, King's College Hospital, and the @home team
172 office.

173 MapInfo includes an add-on function called 'Distance Calculator'. This allowed for a 'nearest
174 neighbour' analysis to be conducted, allocating each of the patients' homes to the nearest ED.

175

176 **Results**

177 The total number of accepted referrals to the @home team, September 2016- November 2016
178 was 71.8% with just under 400 referrals per month with 397 patients identified as being
179 prevented from attending ED (**Table 2**). The 397 patients equate to around 0.3% of the total at
180 the EDs. Thus the @home team prevented around 1 in 300 (the sum shows 1 in 302) patients
181 from presenting at King's College Hospital or St Thomas's ED.

182 ***Insert Table 2 here***

183 In the same period, a total 119,718 patients presented at the EDs (**Table 3**). King's College
184 Hospital recorded 71,688 attendances over the three-month period while St Thomas's ED
185 recorded 48,030 attendances. This equates to approximately 787 patients attending ED in a
186 24-hour period at King's College Hospital and 527 attending St Thomas's ED over the audit
187 period. In relation to the four-hour operational target of seeing 95% of all ED patients, both
188 King's College Hospital and St Thomas's EDs did not achieve this in the audit period covered
189 (September 2016- November 2016) with 81% of King's College Hospital patients being seen
190 within 4 hours and 86.7% of St Thomas's ED patients.

191

192 ***Insert Table 3 here***

193

194 A mapping exercise was performed, using nearest neighbour analysis, to assess which ED the
195 patients seen by the @home team would most likely have attended. The maps offer a visual
196 picture of the location of the @home referrals office in relation to the local hospitals. The
197 points for St Thomas's Hospital, King's College Hospital and the @home team locations, are
198 shown in **Figure 1 below**. The same figure also marks the patients' own home locations. Local
199 authority boundaries were downloaded from data.gov.uk to help better display the
200 distribution of these locations across Lambeth and Southwark.

201 ***Insert Figure 1 here***

202 Most of the patients' homes are closer by straight line distance to King's College Hospital ED
203 than to St. Thomas's ED. This is as expected given the relative locations of the hospitals within
204 the London boroughs of Lambeth and Southwark. St. Thomas's Hospital is located on the River
205 Thames which is at the northern boundary of Lambeth, whilst King's College Hospital sits
206 about 3.3km further south within Lambeth, close to the Southwark boundary, and
207 geographically at the centre of the area covered by the two boroughs combined (**see Figure 2**).
208 This has an impact on referral rates to the @home team. Of the 387 patient records audited,
209 according to the mapping analysis, 298 of their homes were nearer to King's College Hospital
210 ED; 89 homes were nearer to St. Thomas's ED. Therefore, suggesting that from September
211 2016 – November 2016, 298 patients were prevented from attending King's College Hospital
212 ED, with 89 patients being prevented from attending St Thomas's ED.

213

214 ***Insert Figure 2 here***

215

216 ***DISCUSSION***

217 The analysis of the referrals after being checked against the ED prevention tool, showed that
218 out of a total of 1084 patients referred to the @home team, 397 patients were prevented
219 from going to ED. This cohort of patients would have otherwise presumably attended at the
220 ED at either St Thomas's or King's College Hospitals. Following the mapping exercise using the
221 'Distance Calculator on MapInfo software (a 'nearest neighbour' analysis), a conclusion is that
222 298 (77%) of the accepted @home referrals would have instead presented to King's College
223 Hospital ED and 89 (23%) to St Thomas'. This excludes the 10 out of 397 patients that could
224 not be mapped (only 2.5% of the cohort). The @home team is a Guy's and St Thomas' Trust
225 (GSTT) run service, yet the above mapping data suggests that in terms of reducing ED

226 attendances locally (by 397 patients in 3 months), Kings College Hospital benefitted with a
227 reduction in attendances. According to the mapping exercise, 77% of all the referrals
228 prevented from attending ED by the @home team would have likely presented at King's
229 College Hospital ED. In terms of financial benefits, GSTT will charge each patient's Community
230 Commissioning Group (CCG) for the (accepted) referral, so where KCH would have charged per
231 ED attendance, GSTT will now make that charge instead. It could be argued that KCH mostly
232 benefit from reduced attendances, and reduced ED pressures, whilst GSTT benefit to a lesser
233 degree from reduced ED attendances, but also from increased financial gain.

234 From a service delivery perspective, the @home team is demonstrably reducing ED
235 attendances, albeit a small proportion. This clearly has some benefit for under pressure EDs,
236 but as discussed in the literature review, wider benefits in terms of healthcare outcomes,
237 patient satisfaction, and the financial costs need further exploration if the net benefits of the
238 @home team are to be robustly demonstrated (Facultad & Lee 2019; Lee et al., 2017; Lee and
239 Titchener 2016; Varney et al., 2014; Montalto et al., 2010a; Shepperd et al., 2009; Wilson et
240 al., 2003). However, positive results are showing in Victoria State, Australia, where much
241 larger, longer-standing hospital at home services are in operation and in the UK, a raft of new
242 initiatives are being trialled (Lee et al., 2017; Lee and Titchener 2016, Maysum et al 2015).

243

244 The hospital in the home service is a relatively recent development in the delivery of
245 healthcare. Similar to emergency care and its establishment and development as a specialty
246 over the past 40 years, hospital in the home is evolving as the ageing population increases and
247 the need for acute episodes of care for chronic conditions is noted (Ham 2015; Imison *et al.*
248 2017). Hospital in the home is one solution to addressing the crisis in healthcare and the
249 demands on EDs (Hunt, 2016; Lee & Titchner, 2017). Other solutions include primary care
250 facilities placed near EDs and sessional work by General Practitioners in EDs (Imison *et*
251 *al.* 2017).

252 In terms of the mapping exercise, arguably it is journey time, not straight-line distance which is
253 likely a stronger determinant of which ED patients would have visited had they not been seen
254 by the @home team. A completely accurate percentage cannot be statistically offered
255 without further, in-depth analysis. This is because with the data obtained, it is currently
256 unclear as to what mode of transport the patients would have used e.g. cars, ambulance,
257 walking, or even public transport. Each mode of transport will have a different journey time,
258 also different routes may be preferred at differing times of the day. This contributes to more

259 accurate journey times being very difficult to model without further substantial qualitative and
260 quantitative data collection.

261 This issue of whether to use straight-line distances or journey times is less pronounced in an
262 urban area such as Lambeth and Southwark. Denser road networks offer a wider choice of
263 routes, meaning that journeys to hospitals will be closer to straight-line than in areas with
264 fewer roads per square kilometre. 79% of Lambeth is built-up, as is 72% of Southwark, vs 6%
265 of the UK. Geocoding and GIS systems are being used more regularly in healthcare analysis
266 (Phillips et al 2000). Certainly, for this analysis, this method has enabled the @home numerical
267 data to be broken down further by the ED that the patient would likely visit.

268 In terms of which ED patients would have attended, varied human preferences, some less
269 predictable, must be considered. Patients may not want to attend the ED geographically
270 closest to them, with the introduction of 'book and chose' initiatives, patients may have a
271 personal preference. Other factors to consider are shortest or cheapest journey times, and
272 that patients may have had surgery at a particular hospital or be under a specific team. Both
273 the hospitals offer speciality services so for example cardiothoracic services are delivered by
274 GSTT, whereas Acute Stroke services are delivered at King's College Hospital. Therefore,
275 clinical need may also outweigh locality or distance, but it was not possible to examine this.

276

277 As previously acknowledged, there is currently a paucity of research within hospital in the
278 home and as this new specialty develops, there is a need to demonstrate its feasibility,
279 applicability, cost-effectiveness and report patient satisfaction. A book chapter by Ellenbecker
280 *et al.* (2008) highlighted the need for further research into safety and quality of care delivered
281 within the home setting. The authors identify six areas where further research is required
282 when delivering hospital in the home programmes: Medication management, fall prevention,
283 unplanned hospital admissions, nurse work environment, functional outcomes and quality of
284 life and wound and pressure ulcer management. A relatively recent Cochrane review noted
285 that there was still very limited data on hospital in the home and that although it may be a
286 suitable alternative to hospital, the evidence is currently lacking (Iliffe et al 2016).

287

288 **Limitations**

289 Data were only 3 months' worth of data and although sufficient in terms of numerical critical
290 mass (1084 patients), slightly different proportions of @home patients who would otherwise

291 have attended ED may emerge in other seasons of the year. Further, although it was designed
292 to be as accurate as possible and based on the author's (NP) experience as an @home matron
293 determining patient flows, owing to the nature of patient disease and condition, the ED
294 Prevention Tool will not be completely accurate regarding which patients with which
295 conditions would have attended ED. The ED Prevention Tool is also un-validated, however
296 there are currently no other comparable tools to use (Lee et al., 2017; Titchener and Lee
297 2016). Further research could be used to validate the ED Prevention Tool for use in future
298 studies.

299 Another explanation for the relatively low impact on local ED attendances is that there may be
300 a lack of knowledge about the @home service. Therefore, more work needs to be done locally
301 to promote the service and ensure that GPs and other local primary care services are aware
302 that the @home team is a comparable pathway to sending patients to ED. There seems to be
303 some evidence that adoption of hospital at home services has been delayed by the lack of
304 clarity into what is expected from a service like the @home team. Nationally, services like the
305 @home team need to be defined and clarity into the service provision needs to be
306 disseminated to both the public and health care professionals. Only then will any beneficial
307 shifts between using acute hospital settings and delivering comparable care within the
308 community be seen. Certainly, this would have an impact on the number of attendances to
309 EDs, and once established hopefully will contribute towards EDs achieving the 4-hour
310 operational target. In summary, from the data collected, the numerical referral data and from
311 the mapping exercise, it is reasonable to suggest that the assumption can be safely made that
312 the @home team does reduce and prevent a number of ED attendances locally.

313

314 Relating to the 4-hour operational target, the data clearly shows the significant number of
315 patients attending both these EDS with nearly 72,000 attending King's College Hospital and
316 48,000 attending St Thomas's ED, and this equates to a mean 787 and 527 patients being seen
317 in each ED over a 24-hour period. When these EDs were designed, the maximum numbers
318 expected to be treated in 24 hours was 400 and so this clearly demonstrates the strain on the
319 services. The other issue is that patients attend ED because they are unable to get a GP
320 appointment, and this is despite an extra 200,000 appointments being made available in
321 Southwark and Lambeth primary care. Within the context of these figures, it is not surprising
322 that the @home service does not have a significant impact on the 4-hour operational target
323 when all parts of the health service are overburdened.

324 **Conclusion**

325 From this small clinical audit, it is clear that the @home team only reduces a small number of
326 ED attendances each month (roughly 1 in 300 patients). The strains on the local health services
327 require significant investment in in terms of resources and personnel to meet the ever-
328 increasing demands. From the perspective of the @home service, it would be beneficial to
329 undertake more longer-term extensive analyses.

330

331 **References**

332 Cowling T, Harris M, Watt H, Gibbons C and Majeed A (2014a) Access to general practice and
333 visits to accident and emergency departments in England: *British Journal of General Practice*;
334 64(624): e434-9.

335

336 Cowling T, Soljak A, Bell D, Majeed A, (2014b) Emergency hospital admissions via accident and
337 emergency departments in England: time trend, conceptual framework and policy
338 implications. *The Royal Society of Medicine*. DOI: 10.1177/014`076814542669.

339

340 Ellenbecker CH, Linda Samia L, Cushman MJ, Alster K. (2008) Patient Safety and Quality in
341 *Home Health Care in Patient Safety and Quality: An Evidence-Based Handbook for Nurses*
342 Editor: Hughes RG. Rockville: Agency for Healthcare Research and Quality (US).

343

344 Evans N (2017) Clock ticking again on four- hour target. *Emergency Nurse*; 25 (1), 8-10

345

346 Facultad J & Lee GA. (2019) An Evaluation of Guy's & St. Thomas' (GSTT) Hospital @home
347 Service: Patients' Satisfaction of a hospital in the home service. *British Journal of Community*
348 *Nursing*, 24 (4), 159-166

349

350 Fry M, Fitzpatrick L, Considine J, Shabon RZ, Curtis K. (2018) Emergency department utilisation
351 among older people with acute and/or chronic conditions: A multi-centre retrospective study.
352 *International Emergency Nursing*, 37, 39-43.

353 Ham C (2015) Emergency Department pressures need to be tackled through integrated urgent
 354 and emergency care. *BMJ* 2015: 350:h322.

355

356 Hunt L (2016) Emergency waiting times show 'exceptional pressures is now the norm' *Nursing*
 357 *Standard Vol 32 (1)*.

358

359 Iliffe S, Doll HA, Clarke MJ, Kalra L, Wilson AD, Gonclaves-Bradley DC, Shepperd S. (2016)
 360 Admission avoidance hospital at home. *Cochrane Database Syst Rev*, 2016(9): CD007491.

361

362 Lambeth Government
 363 Site.[https://www.lambeth.gov.uk/sites/default/files/State%20of%20Borough%202016%20-](https://www.lambeth.gov.uk/sites/default/files/State%20of%20Borough%202016%20-%20v3.pdf)
 364 [%20v3.pdf](https://www.lambeth.gov.uk/sites/default/files/State%20of%20Borough%202016%20-%20v3.pdf) Accessed September 2017.

365

366 Imison C, Curry N, Holder H, Castle- Clark S, Danielle Nimmons, Appleby J, Thorlby R, and
 367 Lombard S. (2017) Shifting the balance of care, Great Expectations. The *Nuffield Trust*.

368

369 Lee G, Pickstone N, Facultad J, Titchener K. (2017) The future of community nursing- Hospital
 370 in the Home. *British Journal of Community Nursing*; 22 (4): 650-654.

371

372 Lee, G and Titchener K, (2016). The Guys and St Thomas's NHS Foundation Trust @home
 373 service: an overview of a new service. *The London Journal of Primary Care*, Mar; 9(2): 18–22.

374

375 Maysum A, Booth A, Kuczawski M, Mason S. (2015) The Impact of senior doctor assessment at
 376 triage on emergency department performance measures: systematic review and meta-analysis
 377 of comparative studies. *Emergency Medical Journal*. 2015;0 1-10.

378

379 Montalto M (2010a). The 500-bed hospital that isn't there: the Victorian Department of Health
 380 review of the Hospital in the home program. *Medical Journal of Australia*; 193(10): 598-601.

381

382 Montalto M, Lui B, Mullins A, et al. (2010b) Medically-managed Hospital in the Home: 7 year
 383 study of mortality and unplanned interruption. *Australian Health Review*; 34(3):269-75.

384

385 Morrell C and Harvey G (2005) *The Clinical Audit Handbook: Improving the quality of health*
 386 *care*. Bailliere Tindall and RCN, London UK.

387

388 Murray R, Jabbal J, Thompson J, Baird B, and Maguire D (2017) NHS areas planning to cancel or
 389 delay spending due to financial pressures: Quarterly Monitoring Report June. The Kinds Fund.

390 Musa GJ, Chiang P, Sylk T, Bavley R, Keating W, Lakew B, Tsou H, Hoven CW. (2013) Use of GIS
 391 Mapping as a Public Health Tool—From Cholera to Cancer. *Health Services Insights*; 6: 111–
 392 116.

393

394 Nursing and Midwifery Council (2015), *The Code for Nurses and Midwives*, NMC, London UK.

395

396 NHS England: Monthly Performance Statistics. July 2017.
 397 [https://www.england.nhs.uk/statistics/statistical-work-areas/combined-performance-](https://www.england.nhs.uk/statistics/statistical-work-areas/combined-performance-summary/)
 398 [summary/](https://www.england.nhs.uk/statistics/statistical-work-areas/combined-performance-summary/)

399

400 Phillips L, Kinman E, Schinitzer P, Lindbloom E, and Ewigham B (2000). Using Geographical
 401 Information Systems (GIS) to understand Health -care access. *Archives of Family Medicine*,
 402 9:971-978.

403

404 Shepperd S, Doll H, Angus R, Clarke M, Iliffe S, Kalra L, Aimonio N, Tibaldi V and Wilson A.
 405 (2009) Avoiding hospital admissions through provision of hospital care at home: a systematic
 406 review and mete-analysis. *Canadian Medical Association Journal*; 180 (2): 175-182

407

408 Varney J, Weilland T, and George J (2014). Efficacy of hospital in the home services providing
 409 care for patients admitted from emergency departments: an integrative review. *International*
 410 *journal of Evidence- Based Healthcare*; 12 (2): 128-141.

411

412 Wilson A, Parker H, Wynn A and Spiers N (2003) Performance of hospital-at-home after a
413 randomised controlled trial. *Journal of Health Services Research and Policy*; 8 (3): 160-164.

414

415