

Supplementary table 2: Change in wider healthcare service use following digital triage implementations (8 studies)

First author Year Country Reference	Study type	Sample / data size	Staff conducting digital triage	Participants	Comparator	Findings relating to change in wider health care service use (primary care, hospitalisations, ambulance services, ED attendance)
Lattimer 2000 England 32	Cost effectiveness report of controlled trial	>14000 Control group (n = 7308 calls) Intervention group (Nurse telephone consultation): (n=7184 calls)	Nurse (within general practice cooperative)	General population	Usual care (referral to a GP)	Primary care: During intervention period GPs made 428 fewer home visits, generating savings of £3360 (£2578 to £4198) in a year. Hospitalisations: The cost of providing nurse telephone consultation was £81 237 per annum; cost savings were estimated to be £94 422 due to reduction of other costs for the NHS arising from reduced emergency admissions to hospital.
Munro 2000 England 29	Routine data analysis	Study corresponds to the 1st year of operation: 68 500 NHS direct calls from the 1.3 million people served.	Nurse	General population	Service use in regions with no NHS direct	Primary care: There was a significant decrease in use of GP cooperatives at sites using digital triage: change in estimated trend from increase of 2.0% per month before to – 0.8% afterwards (estimated relative change – 2.9% (95% confidence interval (CI)– 4.2% to – 1.5%)) compared to negligible change in control: from 0.8% a month before to 0.9% afterwards (relative change 0.1%; CI: – 0.9% to 1.1%)) Ambulance services: Changes in trends were small and non-significant ED attendances: Changes in trends were small, variable and not significant.

Dale 2003 England 36	Controlled trial	635 calls digitally triaged by ambulance service; 611 non-triaged calls	Nurse and paramedic	Callers to emergency service for non-emergency concern (aged 2+)	Usual care (ambulance dispatch)	<p>Ambulance services: 52% (n=330) of calls were triaged as not requiring emergency ambulance. Of these: 47% had moderate urgency: care needed within 24 hours; 26% needed a routine appointment; 27% self care sufficient. Overall, 9.8% of ambulances were cancelled in the intervention groups (where this was offered).</p> <p>ED attendances: In the intervention group: 81% of patients triaged as requiring ambulance call outs attended ED; 63.4% of patients triaged as not requiring ambulance attended ED.</p> <p>Hospitalisations: Some inconsistency in triage: 10% of those triaged as not requiring ambulance dispatch subsequently required hospital admission</p>
Mark 2003 England 46	Mixed methods (routine data analysis + observation, interviews)	Numbers of calls analysed across three years: 5126 (year 1998) 5702 (1999) 4698 (2000)	Nurse	General population	Service use before implementation	<p>Primary care: Two main 'transitions': 1. Initial increase in GP cooperative workload and in-hours calls. Followed by fall in OOH GP cooperative workload by 18%. Use of primary care centres declined following the arrival of NHS Direct; allocation of home visits initially increased then decreased; OOH doctor advice progressively increased. Within older age groups: decline in both use of primary care centres and home visits, but a rise in doctor advice.</p> <p>ED attendances: Progressive increase in ED attendance</p>
Dunt 2005 Australia 30	Four controlled trials	Random sampling (350 households per trial site)	Nurse (Two "standalone" call centres)	General population	1. Service use before implementation 2. Implementation of two	<p>Primary care: Some types of out of hours care became more frequent in sites using digital triage services</p> <p>Ambulance services: Overall no change in any site</p>

					telephone triage sites within existing 'embedded services' using paper based protocols	
Munro 2005 England 28	Surveys with care providers	571 surveys sent (188/297) responses from GP cooperatives, (35/35) for ambulance services and (200/239) for emergency departments	Nurse	General population	Service use before implementation	<p>Primary care: The 3 year period following digital triage implementation was associated with a reduction in calls to OOH general practice. In the context of an underlying trend of demand rising by about 1% each year, the introduction of digital triage was associated with an immediate 3% fall in demand coupled with a reversal of the trend so that demand began to fall by almost 8% per year</p> <p>Ambulance services: No significant change in emergency ambulance service use.</p> <p>ED attendances: There was negligible change in use of emergency departments,.</p>
Morimura 2010 Japan (Tokyo) 35	Routine data analysis (+ surveys with patients)	26,138 telephone consultations	Nurse and non-clinical call handler	General population	Service before implementation,	<p>Ambulance services: Number of ambulances used per 1 million was statistically reduced compared with that of the previous year: 46 846 vs. 44 689, $p < 0.0001$. The out of hours ambulance use per 1 million people was also significantly reduced: 31 965 vs. 30 370.</p> <p>Hospitalisations: In those who were referred to a hospital by an ambulance ($n = 3252$) 30.8% (1000 cases) were hospitalised. The emergency hospitalisation rate (EHR) decreased annually before the introduction of digital triage service. However, the rate after its introduction was statistically higher 36.5% vs. 37.8%,</p>

						p<0.0001)(EHR increased following the introduction of the service).
Turner 2013 England 38	Routine data analysis	400,000 calls in first year of operation analysed.	Non-clinical call handler	General population	Control sites selected to match equivalent geographical areas	<p>Primary care: In one site - statistically significant reduction in urgent care attendances; 3 sites: reduction in calls to former (nurse led) digital triage service. Overall no change in primary care could be attributed to implementation</p> <p>Ambulance services: Reduction in ambulance emergency calls in 1 site and an increase in another site; All sites showed increase in emergency ambulance incidents. Overall no change in emergency service (999) calls were attributable to implementation</p> <p>ED attendances: Overall no change could be attributed to implementation</p>