

# **Out-of-Hours Primary Medical Care: What Can Research Tell Us?**

## **Appendices for the Rapid Systematic Review**

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## Appendix 1: Systematic review methods.

### Search strategy

The following databases were searched: EBSCOHost; CINAHL; Medline; PsyARTICLES; PsychINFO; SocINDEX; Ovid; and Embase. Searches were carried out by Health Improvement Scotland and by NB. Additional references were identified from references held by COD. Searches were conducted for the time period 1995 to the middle of 2015, covering the period from the introduction of the Primary Care Development Fund for OOH care described in the introduction. Further details are detailed below.

Manual scrutiny of key journals identified two additional papers which were included.

### Search terms and databases.

Name	Databases	Search Terms	No Refs
OOH1			108
OOH2			167
OOH3NB	EBSCOHOST: CINAHL; MEDLINE; PsyARTICLES; PsychINFO; SocINDEX with FULLTEXT  01/01/1995- 31/12/2015	General practice OR primary care AND out of hours OR out-of-hours OR urgent care  Out of hours OR out-of-hours AND impact AND primary care  Out of hours OR out-of-hours AND impact AND general practice  Urgent care AND models of care AND primary care  Peer reviewed  Duplicates removed	277

<b>OOH Kate 3 12.6.15</b>	Ovid: Medline 1996 – June Week 1 2015; EMBASE 1996 to 2015 Week 23.	(General Practice or Primary Care or Family Medicine or Family Practice) AND [(Out of hours or Out-of-hours) or Urgent care]  Duplicates removed  Each term as .mp	1027
<b>OOH Kate 4 12.6.15</b>	Ovid: Medline 1996 – June Week 1 2015; EMBASE 1996 to 2015 Week 23.	(General Practice or Primary Care or Family Medicine or Family Practice) AND [(Out of hours or Out-of-hours) or (Urgent care) or (Unscheduled care)]  Duplicates removed  Each term as .mp	1050
<b>OOH KOD</b>	Endnote library of KOD	Out of hours  Out-of-hours  Urgent care  Unscheduled care  Each term a keyword	224

### **Inclusion and Exclusion Criteria**

Papers were uploaded into DistillerSR software for title and abstract screening; duplicates were removed.

Papers were included if they were:

1. Concerned principally with OOH primary medical care or impact on OOH primary medical care services.
2. Reported on primary or secondary research.

Papers were excluded if:

1. They were not about OOH primary medical care.
2. They did not contain empirical data.
3. They were in a foreign language.

### **Characterisation of identified papers.**

All included papers were reviewed in DistillerSR and characterised by two members of the team, according to the headings in Box 1.

#### **Box 1. Characteristics of included papers**

Aim
Country setting
Service setting
Health care professionals involved
Year study published
Duration of study
Study design
Number of patients/patient records/participants
Patient focus (All patients; Adults; Elderly; Children; Palliative care; Mental health; Other)
Primary focus of the research (Demand & use patterns; Patient views of service; Practitioner views of service; "Appropriateness" of use; Prescribing; Quality/Assessment of triage; Assessment of new models; IT issues; GP training/impact; Other)
Terminology used in study title (Out-of-hours; Urgent care; Unscheduled care)

Papers were also assessed for methodological quality, using standardised checklists.

## Appendix 2. Full list of papers by primary research focus

Primary research focus	
<b>Table A1</b>	Papers dealing with demand, use and outcome
<b>Table A2</b>	Papers dealing with IT and information sharing
<b>Table A3</b>	Papers dealing with quality and safety of care
<b>Table A4</b>	Papers dealing with call triage
<b>Table A5</b>	Papers dealing with GP training
<b>Table A6</b>	Papers dealing with views of, and impact on, GPs
<b>Table A7</b>	Papers dealing with models of care
<b>Table A8</b>	Papers dealing with patient/carer views

**Table A1. Papers dealing with demand, use & outcomes**

<b>Citation</b>	<b>Setting</b>	<b>Study Design</b>	<b>Aim</b>	<b>Key Findings</b>
(Majeed et al., 1995)	GP services, England	Routine data Analysis	To analyse the night visit rate of GP practices by different practice variables.	1993-1994 there were 16, 674 night visits by 129 practices. Strongest positive association for patient variables and night visit rate were age and chronic illness. Lists with higher proportions of those aged under 5 and 5-14yrs had higher night visit rates. No association with higher proportions of those over 65. Negative correlation with lists with higher proportions of those aged 35-44 and with lists with high inflation (difference between estimates of practice pop.).
(Heaney and Gorman, 1996)	GP OOH, Scotland	Routine data analysis	To describe the OOH demand of 8 GP practices prior to change of OOH service arrangements.	2,236 contacts over 10 weeks in 1995 or 265 contacts/1000 patients/year. Busiest OOH periods were weekends and within weekends Sunday mornings were busiest. During weekdays the busiest OOH period was 6-10pm. Doctors rated 62% of OOH calls as necessary. Of 2,236 contacts 64% requested home visit, 31% asked for phone advice. In the end 63% were seen at home, 29% given telephone advice and 8% seen in surgery. Note limitations of single area and 10 week period.
(South Wiltshire Out of Hours Project (SWOOP) Group, 1997)	OOH telephone triage, England	Routine data and questionnaire	To describe the work of a pilot nurse led OOH telephone triage system and asses patient satisfaction with the service.	18 4 hour sessions recorded 56 calls, 21(38%) dealt with by nurse alone, 35(62%) referred to a doctor. 12/35 referred to doctor were dealt with by phone. 30 respondent to patient questionnaire 26(87%) satisfied/highly

				satisfied.
(Shipman et al., 1997)	GP and A&E OOH services, England	Mixed methods; routine data and interviews	To described demand for GP and A&E OOH and compare presenting complaints and patient decision making.	2x3week periods in 1995/1996 2,564 contacted either GP/A&E. 39% to A&E, 61% to GP. Peak time for A&E and GP were evenings, more contacts for A&E after midnight, more to GP Sunday am and weekend afternoons. Children <10 yr 45% of GP but only 26% of A&E contacts. 57% attending A&E made decision to attend A&E themselves. 56% would have attended regular GP had it been open.
(Plauth and Pearson, 1998)	Urgent Care Centre, USA	Questionnaire	Comparison of patients attending urgent care centre vs routine GP with a survey of patients attending urgent care centre; reasons for attendance and attitudes towards primary care.	1996, 1 week - 551 seen at centre, 1000 at routine GP. 38% of those seen at centre seen during normal hours. 421 completed questionnaire. Urgent care patients were younger, reported a need to be seen immediately, difficulty getting a routine appointment due opening hours or logistical problems and a positive attitude towards primary care. Most would have preferred to see usual physician but did not mind when had acute illness.
(Toivanen et al., 1998)	GP OOH services, Finland	Routine data analysis	Comparison and characterisation of use and referrals of three different primary care OOH models.	2926 OOH contacts in 2 months. Patients that could attend their local centre during out of hours used that centre more during the OOH period compared with patients who had to attend a centralised cooperative OOH centre. No differences between age of those attending between different models: youngest age group attended the most and oldest group most likely to be referred to hospital.
(Vehvilainen et al., 1998)	GP weekend service, Finland	Survey of GPs	To examine the pattern of weekend GP referrals for 1 week in 1992 and 1	530 patients referred. 90% were referred same day, 40% to surgical specialties. Men referred

			week in 1994.	more often than women for arrhythmias, hand and foot fractures and dislocations. Most common diagnoses were musculoskeletal, digestive and circulation. Caution – no data on total number seen during weekend, no comparison of weekday referrals and ?reliability of recall.
(Brogan et al., 1998)	OOH services (GP and other), England	Routine data analysis and questionnaire	To describe the volume and type of OOH work by GP OOH and other OOH services and to estimate the costs of such work.	47,828 OOH contacts in 2 months in 1995: 21,649 (45%) with GPs, 12,908 (27%) with A&E, 11,318 (24%) with home nursing services, and 1953 (4%) with ambulance services. Estimate GP OOH co-op cost of £5190/1000 population/year compared to £2290/1000 population/year for A&E services.
(Carlisle et al., 1998)	A&E and GP OOH, England	Routine data analysis	To examine the relationship between GP OOH, A&E workloads and deprivation and distance to A&E.	6 months in 1996 saw 4742 OOH contacts; 2019 GP, 1016 deputising service, and 1707 A&E contacts. Deprivation associated with increased contact rates. Distance no significant impact on OOH contact rate when deprivation accounted for. Significant variation in contact rate between practices.
(Avery et al., 1999)	A&E and GP OOH, England	Routine data analysis and questionnaire	To describe the patter of OOH activity for GP services and A&E, to compare the presenting complaints at both services and to assess those calls dealt with by telephone consultation alone by presenting complaint.	6 months in 1996 saw 5057 GP contacts or 217 contacts /1000 patients/year. 63% to GP or GP deputising and 37% to A&E. Fever and D+V being most common PC to GP. Accidents and injuries accounted for half of presentations to A&E. Note – single city, only 6 month data, underestimate due incomplete recording and collection.
(O'Donnell et al., 1999a)	GP OOH, UK	Review	To examine literature concerning changes in OOH service provision over previous 5 years and to discuss	Quotes increasing OOH demand and development of new models – rota, collaboration, GPs at A&E – cheaper and less

			the issues or models of care hitherto less well examined such as rural OOH provision or single handed practices.	tests, nurse telephone triage, GP cooperatives, primary care emergency centres – national survey evaluation of cooperatives- work load, some comparisons of models, GP stress levels reduced with new coop model. Need for national comparisons of quality, equity of access, efficacy +/- satisfaction – although difficult to interpret. Burden of OOH in rural areas or in single handed practices need assessment as well as cost comparisons of models.
(O'Donnell et al., 1999b)	GP OOH, Scotland	Routine data analysis	To describe OOH contacts and the patient transport service use by socioeconomic category.	3193 OOH contacts in 1 week. Children and adults higher contact rate from deprived areas whereas elderly from affluent areas had higher contact rates. More deprived deprec associated with home visits but not telephone consult or centre visit. Deprived patients used transport service more.
(Hulland et al., 1999)	GP deputising/traditional on-call, England	Prospective case review	Describe use of GP and A&E services outside normal hours for children under 5.	1072 contacts over 6 months. Contact rate of 751/1000 children/yr. 80% dealt with by GP and 34% of those dealt with by telephone. Variation in presenting complaint and being dealt with by phone.
(Vedsted and Olesen, 1999)	OOH service, Denmark	Prospective case review	Describe the OOH use of the 10% who use OOH the most – 'frequent attenders'.	218 237 OOH contacts in 1990. FAs accounted for 42% of all OOH contacts. Of those defined as FA in 1990 2/3 contacted OOH the following year at least once. However regular frequent attendance over 5 years was low. Females and older patients were highest users and largest numbers of FAs were women. If FA for longer had higher chance of remaining a FA.
(Drummond et al.,	GP OOH,	Routine data	To evaluate reason for OOH contact	3193 OOH contacts over 1 week. 1115

2000)	Scotland	analysis and questionnaire	and relate this to sociodemographic data and presenting complaint.	questionnaires completed (69.3%). Most common reasons for contact were: perceived urgency, pain and anxiety. Patient socioeconomic deprivation status associated with higher perceived difficulty of day time access.
(Salisbury, 2000)	GP OOH, UK	Review	To provide a review of demand for UK OOH care.	Different searches limited to UK, 1959-1999. Difficulty measuring and comparing demand but some more consistent characteristics of demand patterns – eg age of patients, time of contact etc. Some evidence of increased demand over time but difficult to corroborate. Will become easier with more comprehensive electronic data.
(Salisbury et al., 2000)	GP OOH cooperatives, England and Scotland	Routine data analysis	To estimate the demand and supply of OOH care from a representative sample of cooperatives.	899 657 OOH calls over 12 months. Rate of call highest before midnight and highest for 0-4 yr olds, peak demand Sunday mornings, Scotland higher rate than England, more deprived higher than less deprived. High variability between cooperatives in the proportion offered consultations at centre, over the phone or at home. Although only takes some data from co-ops using Adastra software and so may not be representative sample.
(Payne, 2000)	GP OOH co-op, and deputising, emergency social work, 24hr psych clinic, 24hr community mental health telephone line,	Retrospective case review/routine data analysis	Patterns of OOH use by those with mental health problems in a deprived urban area.	4 weeks 1998, 556 contacts, 56% male. 45% presented to A&E. More males present to emergency psych clinic; females to GP. Self-harm more likely to present to A&E; suicidal patients to GP. Differences between age groups and sex. Note these are deprived urban figures and short time period.

	A&E and ambulance service. London			
(Murphy et al., 2001)	GP OOH services, Ireland	Routine data analysis	Compare the OOH consultation rate of deprived patients seen by rural vs non-rural GPs across 2 Irish Health Boards.	102,286 OOH contacts in 1998. State higher median rate for rural vs urban (290/1000 vs 220/1000).  'Whilst causative conclusions are difficult to draw from international comparative work, at the very least such a study will harness the natural laboratory that is European general practice.'
(Vedsted et al., 2001)	OOH service and Routine practice, Denmark	Retrospective case review	Compare the rate of day time attendance to the rate of OOH attendance – are frequent day time attenders also OOH frequent attenders?	339 009 (81.5% of pop) patients made day time contact, 84 225(20.2%) patients to OOH in 12months. 34 428 (8.3%) daytime FAs, 8154 (2.0%) out-of-hours FAs, and 3429 (0.8%) both day and OOH FAs. 56.3% of day time FAs did not attend OOH at all. FAs accounted for a third of day time and OOH contacts. 10% of day time FAs were also OOH Fas. ?Already understood that intervening daytime FAs may help reduce OOH FA.
(O'Reilly et al., 2001)	GP OOH cooperative, Northern Ireland	Routine data analysis	To examine for geographic and demographic variation in OOH contact outcomes.	Data for 78,907/110,357 OOH calls in 1998. Higher call rates at extremes of age and 74% of calls within 20mins drive. Call rate positive correlation with deprivation and negative correlation with distance. Measures of need - mortality ratio and long term illness census data – not correlated with call rate. Most received telephone advice, of those seen younger more likely at centre older more likely home visit. Telephone only positively

				correlated to distance and travel time from centre. Note variation between centres.
(Barrett et al., 2002)	District nursing service, UK	A retrospective examination of routine community-based data for a newly established intermediate care nursing service over a 12-month period from April 1998 to March 1999.	To explore routine data sources to assess its potential for monitoring performance.	The service provided out-of-hours community nursing care for 903 patients in 1071 episodes of care and 6033 recorded contacts. Although information about patient characteristics and episode start-dates were complete, over half the episode end-dates were missing. The data suggested that this was primarily a domiciliary service for people aged 65 years and over, covering six main care programmes: genito-urinary, neoplasm, wound management, elderly care, gastro-intestinal and locomotor care. Most of the referrals were from primary care clinicians. At present, the way we view and count activity can fragment services and increase the stress on clinicians. We need to shift our service-focused approach to a patient-centred one. This can be done now by consistent use of patient identifiers and by encouraging services to plan data linkage. But a gap still remains with regards to outcomes, limiting our ability to measure effectiveness
(Hampers et al., 2002)	Regional paediatric OOH service, USA	Billing records reviewed (?routine data analysis) and questionnaire to paediatricians	To describe a regional, community-based paediatric urgent care network (PUCN). To compare 4 different parts of a city catered for by different paediatric out of hours services.	In 2001, 37 143 visits /consultations at paediatric out of hours centres/paediatric urgent care centres. Minor trauma, ear complaints, and viral illnesses accounted for 70% of visits. 2.2% of visits required admission or transfer. 110 Paediatricians, representing all 55 practices, responded to questionnaire: reported high levels of use, good communication and high satisfaction with

				service. Note – billing and costs form part of conclusion and analysis that may not be transferrable.
(Munro et al., 2003)	GP OOH co-op, England	Routine data analysis	Study the effect of distance from OOH centre on the number of face to face consultations: at the OOH centre vs. house calls.	31,048 calls, 14 months 1997-1998, 57% seen in person. 75% of those were seen at centre, remainder were house calls. Reduced odds to be seen in person with increasing distance but odds of house call vs. consultation at centre did not change significantly with distance. Patients from more deprived areas less likely to be seen in person but of face to face consultations higher odds to be seen at home compared to less deprived patients.
(Pooley et al., 2003)	GP rota, deputising service and co-op., England	Routine data, questionnaire and qualitative interviews	The differences in OOH services in 2 Health authorities in 1998 and a comparison of delay times. Patient and practitioner views.	744 questionnaires, 83 interviews. Variation in proportion of house call: telephone advice: consultation between areas as well as delay time. Suggest variation less to do with geography or patient characteristics but rather due to different service organisation.
(Thomson et al., 2003)	GP OOH services, Scotland	Mixed methods, questionnaire, semistructured interviews, economic analysis	To compare extant models of OOH service delivery.	Survey 1998, 75% Scottish pop. have co-operatives. Characterised 10 'models' based on level of rurality/urbaness and whether co-op or rota etc. Suggests categorical differences between rural vs urban services. Most co-operatives had some governance procedures like protocols but there was variable quality of patient satisfaction surveys and only 31% had quality standards. Data from rotas and deputising services was limited. Most patients satisfied and more were satisfied when felt the clinician listened. Large variation in cost/1000 population.

(van Uden et al., 2003)	A&E and OOH Co-operatives, The Netherlands	Routine data analysis	To compare the number and characteristics of patients attending A&E and GP OOH co-operatives in two areas that have different GP OOH organisation structures.	One co-op located at an A&E department with open access (all patients passing through GP prior to A&E) the other co-op in a city centre 5km and 9km from the nearest A&E with GP access via telephone first. 3 weeks in 2001 recorded 6879 GP OOH contacts and 1719 A&E contacts for both locations. Contact rate for OOH GP was 279/1000/yr for co-located co-op and 238 for the other OOH co-op whereas no significant difference for A&E contact rates. For the co-located co-op less patients received telephone advice, more attended for consultation and fewer received a home visit.
(Beale et al., 2006)	Kennet and North Wiltshire Primary Care Trust, UK	Routine data review of all recorded out-of-hours calls to GPs In North Wiltshire Jan-April 2004.	To test if out-of-hours demand in UK primary care is predicted by council tax band.	1335 out-of-hours contacts were recorded in the study period. It was possible to attribute a council tax valuation band to 1297 of the patients. Contact rates were significantly associated with council tax band: patients from council tax band A homes contact out-of-hours services twice as often as their counterparts at the other end of the council-tax-band spectrum.
(Giesen et al., 2006)	GP OOH and A&E, The Netherlands	retrospective case review	To gain insight into current patient characteristics and the care received at both GP cooperatives and A&E departments in order to help prepare and develop effective models for collaboration out of hours.	258 patients contacted the GP cooperative and 43 self referred to the A&E department per 1000 patients per year. A wide range of problems were seen in the GP cooperative, mainly related to infections (26.2%). The A&E department had a smaller range of problems, mainly related to trauma (66.1%). Relatively few urgent problems were seen in the GP cooperative (4.6%) or for self referrals in the

				<p>A&amp;E department (6.1%). Women, children, elderly, and rural patients chose the GP cooperative significantly more often, as did men and patients with less urgent complaints, infections, and heart and airway problems.</p> <p>DISCUSSION: The contact frequency of self referrals to the A&amp;E department is much lower than that at the GP cooperative. Care is complementary: the A&amp;E department focuses on trauma while the GP cooperative deals with a wide range of problems. The self referrals concern mostly minor, non-urgent problems and can generally be treated by the general practitioner, by a nurse, or by advice over the telephone, particularly in the case of optimal collaboration in an integrated care facility of GP cooperatives and A&amp;E departments with one access point to medical care for all patients.</p>
(Bury et al., 2006a)	GP OOH Co-operative, R.O. Ireland	Questionnaire	To document the activity of the 11 existing OOH co-operatives in 2002.	(Free GP services for 30% of pop. on basis if low income/>70yrs. And co-ops provide for approx. 40% of country population). Variety in size, facility, rural/urban and staff of co-ops. 3/11 did not do home visits. Averages (mean) of activity 34% of contacts dealt with by telephone advice alone, 54% contacts seen at centre, 12% were home visits. Mean contact rate of 244/1000/yr and consultation rate of 144/1000/yr. Mean non-urban vs urban contact rate of 262 vs 75/1000/yr. Urban co-ops less telephone advice only and less home

				visits but more centre consultations.
(Giesen et al., 2007c)	GP OOH, The Netherlands	Routine data analysis	To study the relationship between the waiting time for a home visit and the distance to the GP cooperative	The average waiting time for 5827 consultations was 30.5 min. Traffic intensity, home visit intensity, time of day and urgency of the complaint all seemed to affect waiting times significantly. 88.7% of all patients were seen within 1 hour. In the case of life-threatening complaints (U1), 68.8% of the patients were seen within 15 min, and 95.6% of those with acute complaints (U2) were seen within 1 hour. For patients with life-threatening complaints (U1) the percentage of visits that met the time target of 15 minutes decreased from 86.5% (less than 2.5 km) to 16.7% (equals or more than 20 km). Discussion and conclusion. Although home visits waiting times increase with increasing distance from the GP cooperative, it appears that traffic intensity, home visit intensity, and urgency also influence waiting times. For patients with life-threatening complaints waiting times increase sharply with the distance.
(Moll van Charante et al., 2007)	GP OOH co-op and A&E, the Netherlands	Prospective and retrospective case reviews	GP OOH and A&E use patterns comparing 2 x 4 month periods 5 years apart.	11,375 GP OOH contacts 1584 A&E contacts. Similar contact rate at both after 5 years. Diagnoses presenting at both as expected. 80% A&E self-referrals presented with an injury and 20% of those had a fracture. Authors suggest reasonable A&E self-referrals and no change in demand/use after population more aware of service.
(Rossdale et al., 2007)	GP OOH Co-op, England	Routine data analysis	To examine for variation in OOH referral rates and identify factors that	Exclusions aside there were 33,808 face to face OOH contacts over 3 years with 149 GPs,

			might influence the rate.	one co-op. Large variation in referral rates. Factors that had independent predictive association with increased referral rates was female sex of GP (AOR 1.37) and time (later contacts) and place of consultation (home visit vs practice). Note relatively small number of GPs being compared however all in similar place working to similar standards and no difference found for years since registration, employment status and number of contacts seen once sex and time and place of consult controlled for.
(Lordan, 2007)	GP OOH Co-operative, The Republic of Ireland	Routine data analysis	To investigate for consistency of care across OOH services.	Service choice influenced by patient call and seasonal characteristics. Patient symptoms are primary driver of the type of service a patient receives.
(Benger and Jones, 2008)	A&E, England	Patient questionnaire, 2005	Examine the extent to which patient behaviour and referral pathways may be contributing to increased ED attendances and hospital admissions.	200 patients recruited. Direct attendance at A&E was more common when help was sought by bystanders. 57 patients attended A&E directly, 45 of whom dialled 999 for an emergency ambulance. Most patients who attended A&E directly did so as a result of perceived urgency of their condition or have an ambulance called on their behalf and there was incomplete awareness of the out-of-hours GP service. The majority of adult patients who are admitted to hospital with an acute illness seek professional help from primary care in the first instance. The shift towards A&E care appears partly driven by changes in general practice and unfamiliarity with the new arrangements for out-of-hours primary care

				provision.
(Hansen and Hunskaar, 2008)	GP OOH, Norway	Routine data analysis	To pilot and establish a nationally representative network and develop the requisite procedures for collecting continuous routine data from out-of-hours services.	7 out of hours clinics selected covering 212, 921 inhabitants. Recorded 23, 346 contacts in last 3 months of 2006. Report quality data with minimal missing data. Suggest this 'sentinel' data be useful for research and service planning.
(Turnbull et al., 2008)	OOH call centre, England	Routine data analysis	Describe the rate of calls to OOH services and compare by measures of deprivation, distance and rurality.	34 229 calls in 2 months. There was a small but significant negative correlation of distance with call rate. Rurality also had negative correlation with call rate. Deprivation was associated with higher call rates and this association was strongest in urban areas.
(Zakariassen and Hunskaar, 2008)	OOH services, Norway	Questionnaire	To assess use of a medical radio network and the level of access to defibrillators in OOH services.	282 local OOH service organisations, showed that there was regional variation in the response to whether or not local GPs used the national radio network or had access to a defibrillator. It highlighted that an ideal OOH service should have standardised and timely access to communications and emergency equipment as well as transport. Note – note sure how we can relate this to GP OOH in Scotland as we have no radio and pretty sure there is a defib available at all OOH sites.
(Scott-Jones et al., 2008)	GP OOH services, New Zealand	Prospective case review	To describe the OOH activity of a rural community in New Zealand with a recently established new model of organisation.	204 OOH encounters over 1 month in 2007. Total contact rate was 320/1000/yr whereas face to face contact rate was 245. Higher rate for Maori. 44% patients seen by GP, 45% by nurses, 11% by ambulance staff. 78% treated without need for hospital referral. Nurses referred more to A&E than GP. Note voluntary ambulance service and fee for private GP.

(Giesen et al., 2008)	GP OOH Co-op, The Netherlands	Retrospective case review	To estimate the incidence of rude or aggressive behaviour of patients in GP OOH and highlight factors associated with such behaviour.	36,259 OOH contacts from 2001-2002 were assessed. 545 or 1.5% involved rudeness, verbal aggression seen in 67 (0.2%) and no physical aggression was recorded. 50% of rude or aggressive cases associated with anxiety, sorrow, or pain. Around 40% associated with argument regarding face to face consultations and 8% regarding medication. Men, younger patients, mental health problems, night contacts more associated with rudeness or aggression. Urgent problems less associated. Study relies on recording incidents of rude or aggressive behaviour.
(Margas et al., 2008)	GP OOH Deputising service, Poland	Routine data analysis	To describe variation in OOH demand, identify associated GP practice characteristics and describe patient characteristics of frequent users.	2 years, 2003-2004, 173,345 face to face doctor consultations, 62,727 'nurse procedures'. 86% of GP contacts were consultations at OOH centre, remainder home visits. Highest daily number of consultations in Nov-Jan and second peak in May-Jun. Lowest in July. Similar for home visits but no second peak seen and proportion of home visits increased over winter. Little daily variation but highest on Fridays. Roughly 80% of workload 6-10pm on weekdays. Practices closer to OOH centre had higher contact rates, and those with older patients had more home visits. Note similar OOH definition, but OOH was new in Poland at the time. Also no telephone triage.
(Richards et al., 2008)	GP OOH services, England	Routine data analysis	To assess for change in demand and quality of care of patients with cancer before and after the new GMS	2x 1 year periods 2003-2005 370,220 OOH calls, 7574 (2%) 'core medical service calls' (3433 pre-contract, 4141 post-contract) were

			contract on OOH provision.	cancer related. Suggests proportion of cancer related calls pre and post contract was stable but overall OOH call rate increased post contract by 26% (185-233/1000). Post contract – proportions of cancer calls resulting in hospitalisation stable, increased proportions receiving telephone advice and in those attending OOH centre post contract. Also saw increase in time lag from call logged to triage.
(Hansen et al., 2009)	Emergency services and OOH services, Norway (National and Local telephone triage and OOH GP services)	Routine data analysis	To describe the activity of OOH services during 2007 within a representative sample of 'casualty clinics'.	85, 288 contacts and an average contact rate between casualty clinics of 399/1000 people. 77% classified as non-urgent and 63% ended as consultation with a doctor. 0-9 yr olds highest and 40-59 yr olds lowest contact rates. Women had higher rates than men. 51% contacts in afternoon period, 37% in day time and 12% at night but variety between clinics. 2/3 of contacts were by telephone. It seems this data includes in hours contacts as well as OOH contacts.
(Fry, 2009)	OOH services, International	Systematic Review	To review OOH care models that reduced A&E workload with a focus on the barriers and facilitators to successful model implementation.	Searched studies from 1970-2009, found 74 relevant. Identified barriers (here have omitted those only relevant to Australian system): speed and delivery of telephone triage – ambulance demand up with delay to respond to call. Gatekeeper function – suggest that other services could refer other than solely GP (e.g. A&E to physio/dietician), more collaborative and integrated services required. Extended role for paramedics-evidence that see and treat option could reduce A&E demand. Segregation of medical records:

				<p>opinions/perception rather than evidence. Patient expectations: suggest unreasonable expectations barrier to patient satisfaction. Financial barrier: suggest lack of A&amp;E user fee could reduce inappropriate A&amp;E use, no evidence cited. Facilitators: Integration – eg GP in A&amp;E reduced cost and A&amp;E activity. Location: co- or nearby location of services to A&amp;E, purport evidence for sustainability and success. Appointment system: suggest not having appointment system preferred by patients. Financial incentives: can lead to reform but lacks evidence of impact on OOH. Nurse practitioners: evidence for high (and safe) patient turnover. Public awareness/media: success of model influenced by public perception/behaviour – low use of WiC cited.</p>
(den Boer-Wolters et al., 2010)	GP OOH, The Netherlands	Retrospective case review	To assess the characteristics of the frequent attenders (FAs) and the presented morbidity during their consultations and to study the persistence of frequent attendance.	<p>44 953 contacts were made in 2007. Frequent attenders together with very frequent attenders made up 10% of patients and 23.6% of the total number of contacts. VFA alone represented 1% of the patients but 7.7% of the annual consultations and more often reported agitation as reason for encounter. The prevalence of psychiatric diagnosis in the VFA group (15.3%) was significantly higher than in other groups. Reassurance was the most frequent prevalent management action in each group. The prevalence of chronic disease and psychological problems was higher in those who attended more often.</p>

(Johansen et al., 2010)	GP OOH co-op and GP in hours, Norway	Retrospective case review	Mental health diagnoses during OOH compared to normal working hours in a population of 23,607.	Contacts in 2006:11, 976 at OOH and 61,783 in hours. 2.2% caseload at OOH mental health; 8.7% in hours. At OOH, higher proportion of psychosis, substance abuse and suicidal behaviour. Note may underestimate prevalence as this is first diagnosis data.
(Philips et al., 2010c)	GP OOH service and A&E, Belgium	Prospective case review before and after change/intervention.	OOH use before and after set up of GP OOH Co-operative compared with areas with no cooperative.	5149 contacts over 4 months (2months prior to change, 2 after). Total contacts increased, significantly more so for area with co-op. No sig change to A&E contacts but less self-referred ambulances. Note this GP co-op not available during weekdays and no telephone triage.
(Philips et al., 2010b)	A&E and GP OOH, Belgium	Prospective case review and questionnaire	To describe the number of patients who choose A&E versus GP OOH and investigate their socioeconomic characteristics.	Over 2 weekends in January 2005 1,970 patients contacted, 1,611 took part. 640 saw GP, of those 93.2% either the patient or family recommended calling GP, 971 in A&E group and 64% went to A&E out of own initiative. Factors associated with choosing GP on call: female, registered with GP, speaking national language. Those associated with choosing A&E: male, visited A&E in last 12months, speaking another language, African nationality, lack of insurance.
(Turnbull et al., 2010)	GP OOH co-operative, England	Mixed methods: Routine data analysis, semi structured interviews, non-participant observation, retrospective case	To investigate the relationship between deprivation, distance and use of telephone based OOH by children 0-4 years old and to explore the experiences of users (parents/guardians).	Contacts from Jun + Dec 2003: 34,229 calls, 5697 (17%) for 0-4yr olds, 54% of these were for boys, call rate of 673/1000/yr. Higher rates from more deprived and closer address. Authors described 3 themes from qualitative data to explain geographical variation – ‘familiarity of and trade-off between services, legitimacy of demand and negotiation.’

		review		Suggest telephone based services may not overcome geographical barriers to access.
(Huibers et al., 2011b)	Primary Care OOH or emergency services, 8 European countries.	Retrospective case review/routine data analysis	To compare presenting complaint and diagnoses in patients contacting OOH services in 8 European countries.	13154 OOH contacts analysed. Similar age distribution across countries but sex distribution more variable. 'general and unspecified symptoms' 13.2%, 'respiratory' 20.4%, 'musculoskeletal' 15.0%, 'skin' (mean 12.5%), and 'digestive' (mean 11.6%). Further analysis of age distribution. Authors suggest similar diagnoses presenting to OOH primary care across countries. Low incidence of life-threatening problems.
(Huber et al., 2011)	GP OOH Services, Switzerland	Questionnaire	To describe the workload and satisfaction of OOH GPs.	Surveyed all GPs 'on-duty', 2 weeks in 2009 - 295 total OOH episodes. Responses for 148 episodes, 93 GPs. 433 total contacts, only 382 contacts were characterised, 65% contacts were female. Median contact rate of 5 per OOH episode/GP. Home visits most common. 50-60% GPs felt burdened and disrupted by OOH but 58-64% felt OOH had no negative impact on their health. most common presenting complaints were general /unspecified (31%), respiratory (28%) and Musculoskeletal (19%). Note - Duty GP responsible for 24 hr period 'night doctor' provides care from 10pm – 7am with duty GP providing back up during that period. Analysis in paper focuses on period prior to night duty doctor as few visit during night period.
(Fry, 2011)	OOH services, International	Systematic Review	To look for impact of OOH models of care on demand for A&E, ambulance and GP services.	87 studies (search from 1970-2011) reviewed with CASP. 44 from UK, Scotland 1. 5 RCTs. 6 models with evidence of impact – although

				<p>mixed and minimal stat significant evidence. Minor injury units and practice nurses managing minor illnesses – evidence patients could be directed from A&amp;E/GPs. Minimal evidence for impact on A&amp;E workload. Walk in centres – good pt satisfaction, weak evidence for reduced A&amp;E/GP workload. Telephone triage – mixed evidence for reduction in GP/A&amp;E work load but balance in favour of reducing workload especially GPs. GP co-ops – mixed again but some evidence of reduced GP and A&amp;E workload. Positive effect on GPs lives. Ambulance officer care – some evidence for reduced A&amp;E workload, direct to MIU reduced time, safety questioned for treat and refer. GP integrated into A&amp;E – reduced A&amp;E workload, less tests/referrals/cost.</p>
(Welle-Nilsen et al., 2011)	GP OOH, Norway	Prospective case review	To describe the pattern of 'minor ailments' in OOH.	<p>210 OOH consultations observed. 58 (28%) were for MAs with cough and/or upper respiratory symptoms being the most common MA observed but notes that study was done in Nov-Dec when these may be more common. The authors suggest that if the study was done in the summer another seasonal MA would be more prevalent. It estimates that 18% of the OOH consultation time taken up by MAs.</p>
(De Korte-Verhoef et al., 2012)	GP OOH, The Netherlands	Retrospective case review	To explore hospital referrals of palliative care patients for whom an out-of-hours general practitioner was called.	<p>(1/Nov/2005 to 1/Nov/2006) 529 charts for palliative care patients: 13% were referred to hospital Palliative care patients with cancer (OR 5,1), cardiovascular problems (OR 8,3), digestive problems (OR 2,5) and endocrine, metabolic and nutritional (EMN) problems (OR</p>

				2,5) had a significantly higher chance of being referred. Patients receiving professional nursing care (OR 0,2) and patients for whom their own general practitioner had transferred information to the out-of-hours cooperative (OR 0,4) had a significantly lower chance of hospital referral. The most frequent reasons for hospital referral were digestive (30%), EMN (19%) and respiratory (17%) problems.
(Rubin, 2012)	Minor injury units, General Practice, England	Retrospective case review	Description of patients attending MIUs and their subsequent, unscheduled use of GP or A&E services.	1995 patients attended MIU. 63% treated and discharged, 2.7% subsequently attended A&E, 21.8% subsequently attended GP. 855 (42.9%) received further care, 265 (29.9%) had unscheduled further care. Diagnosis concurrence of 93.2% between subsequent GP visit and initial MIU visit. Caution – cannot differentiate between those that attended GP based on explicit advice or and those that attended due to ‘open ended- safety netting’.
(Johansen et al., 2012)	Acute Psychiatric Unit, Norway	Prospective case review	To explore the differences between admissions to an acute psychiatric unit in terms of patient characteristics and referral circumstances.	5322 admissions over 3 years (2005-2008) by 2841 patients. 60% patients admitted due to exacerbation and 19% admitted due to new episode of illness. Half referred by casualty clinics (equivalent of OOH GP) and no difference in terms of avoiding admission between referrers.
(Sandvik et al., 2012b)	Emergency primary health care services, Norway (In and out of hours urgent services)	Routine data analysis	To compare immigrant use of emergency primary care services with that of native Norwegians.	1,715,278 EPHC contacts from 2008. Slightly lower rate of contact for immigrants but higher rate than Norwegians in immigrants aged 0-5yr. Women higher rate than men in all groups. Migrant groups associated with longer consultations, lab tests used more for migrants

				of specific countries. Differences noted between migrants of different countries: contact rate, employment, income, length of stay, non-specific pain, psych. diagnosis. Excluded short term visitors, some asylum seekers, illegal residents and those missing ID numbers (23% of total, included a lot of children).
(Huibers et al., 2013b)	GP OOH with A&E co-located, The Netherlands	Retrospective case review	To explore the flow and outcomes of patients attending co-located GP OOH and A&E, with a focus on self-referring patients.	319 GP OOH consultations, 356 A&E consultations, 78% were non-urgent. Most GP contacts completed at the GP OOH without follow-up. More non-urgent A&E patients had tests, mainly X-rays. 88% non-urgent A&E patients had follow-up contact, usually at an outpatient clinic. 35% of non-urgent GP OOH contacts had follow-up. This may reflect differences in patient populations between the A&E and GP OOH or suggest opportunities for improving efficiency of planning follow-up contacts.
(Raknes et al., 2013)	OOH casualty clinics, Norway	Routine data analysis	The effect of distance on OOH 'casualty clinic' use – 5 years data.	Note 'casualty clinic' is an 'emergency primary care centre' that handles life threatening emergencies. Distance reduced contact and consultation rate even more so. Relationship strongest for cases triaged as non-urgent.
(Willems et al., 2013)	GP and A&E OOH at weekends, Belgium	Retrospective case review	To describe OOH weekend use in relation to socioeconomic status and distance from OOH centre.	7723 patients with first attendance over 16wks and 2 public holidays. Roughly half went to A&E and half to GP OOH but during day time hours more go to GP and more to A&E during night. Men slightly more likely than women to attend A&E. Older patients more likely to go to GP. More go to A&E if

				closer to A&E and if from more deprived area. Note that there are differences in cost and timing of payments when attending GP OOH versus A&E in Belgium.
(Huibers et al., 2013a)	GP OOH Co-operatives, The Netherlands	Questionnaire	To investigate associations between patient experiences of nurse led telephone triage and co-op organisational factors with the likelihood of self-reported subsequent contact for the same health problem.	13,953 patients who had OOH contact 2009-2011 sent questionnaire. 16 co-ops. 7039 questionnaires returned (50% response rate), 5678 available for analysis, all had telephone contact initially. 40.6% subsequently had consultations at co-op, 31.1% had telephone consultations only, and 28.4% received home visits. 47% of total had follow up contact- 36% of which were in primary care. 59% of home visits had follow up as did 45% of telephone contacts only. More likely to have follow up if older, had home visit, had more negative experience of telephone triage or called a co-op that did more telephone consultations.
(Flarup et al., 2014c)	GP OOH, Denmark	Prospective case review and patient questionnaire	To evaluate the reasons for encounter, the outcome and the patient perspectives.	383/700 duty GPs participated at least once. 21,457 contacts were registered and 59% were completed by telephone. Telephone consultations were most often offered to children and home visits primarily to elderly patients. Home visits were most often offered to patients aged 75 years or more. 8410/16,434 patients completed the questionnaire. Females comprised the majority of the contacts and of the respondents in the patient survey.
(Flarup et al., 2014a)	GP OOH, Denmark	Marked as retrospective case review -	To describe contacts to OOH services by patients with chronic diseases: reason for encounter, diagnosis,	13,930 patients. 4,912 (35.2%) had at least one of the five chronic diseases. A quarter of all calls to OOH were due to an acute

		?prospective	severity of symptoms, and outcomes.	exacerbation in this chronic disease group. 32.6% of these calls came from patients with psychiatric diagnoses. Patients with chronic disease were more likely to receive a face-to-face contact than the remaining group of patients, except for calls from patients with a psychiatric disorder who were more often completed through a telephone consultation. Patients with heart disease calling due to a new health problem formed the largest proportion of all OOH referrals to hospital (13.3%) compared to calls from the other groups with chronic disease (3.4-6.7%).
(Adam et al., 2014)	GP OOH service Grampian, Scotland	A retrospective review of case records between 1 January 2010 and 31 December 2011.	To explore the reasons for contact and the range and prevalence of presenting symptoms in patients with established cancer who presented to a primary care OOH department.	852/950 patients made contact because of a symptom. The remaining 97 were mostly administrative and data were missing for one patient. The most frequent symptoms were pain (n = 262/852, 30.8%); nausea/vomiting (n = 102/852, 12.0%); agitation (n = 53/852, 6.2%); breathlessness (n = 51/852, 6.0%); and fatigue (n = 48/852, 5.6%). Of the 262 patients who presented with pain, at least 127 (48.5%) had metastatic disease and 141 (53.8%) were already prescribed strong opiate medication. Conclusion: Almost one-third of patients with cancer seeking OOH primary medical care did so because of poorly controlled pain. Pain management should specifically be addressed during routine anticipatory care planning.
(Belche et al., 2014)	OOH clinic, Belgium	A retrospective analysis of routine data for 2009	to study the activities recorded by the first out-of-hours clinic that has been opened, as a pilot study.	A total of 3949 contacts were recorded, 91.6% of contacts were handled locally, 8.4% resulted in hospitalization. In addition, 52% of

				contacts were with patients aged between 25 and 65; 29.9% of contacts were with paediatric patients. Patients over the age of 65 made up 18% of contacts. The most common pathologies were respiratory.
(Berger, 2014)	GP OOH service, The Netherlands, March 2008- Feb 2009	Observational cohort study.	To determine the frequency of alarming signs/symptoms in febrile children in primary care.	10,476 face to face patient contacts; 59.7% had one or more alarming signs and/or symptoms but the majority of the alarm signs/symptoms were in <10% of patients. Suggests a need to determine the predictive value of alarming signs/symptoms for serious infections in primary care and prognosis.
(Huibers et al., 2014)	GP OOH, Denmark and The Netherlands	Routine data analysis	To compare and investigate the rates of use of GP OOH in Denmark vs The Netherlands.	All OOH contacts Sep-Oct 2011. Denmark- 80 contacts/1000 inhabitants; Netherlands- 50/1000. Significantly higher rate for all three types of contact in Denmark; most for telephone consultations -47/1000 vs 20/1000, particularly for the youngest age group -154/1000 vs 39/1000. Danish more home visits than Dutch while Dutch slightly more clinic consultations. Speculate that difference in triage system – GP vs. nurse – could account for difference but suggest further research into explaining difference in contact rate. Note – also shows lower rate of contact of other services in Netherlands ? reflects a cultural difference.
(Flarup et al., 2014b)	GP OOH, Denmark	Observational study/ Questionnaire	To investigate relationships between day time GP use and OOH use as well as chronic disease exacerbation OOH and day time GP use.	11,897 systematically selected adult patients who contacted OOH during 2010-2011. 2,665 patients (22.4%) had one of the five chronic diseases studied. Between 1/3-1/4 of those with chronic diseases were seen by day time

				GP 30 days prior to OOH exacerbation. Significantly higher OR for exacerbation for those with cancer and psychiatric disease. Caution – do not know which disease the exacerbation refers to therefore may be overestimate exacerbations. Also no way of telling if exacerbation was avoidable however data did show that annual review was associated with less OOH contacts.
(Harris and McDonald, 2014)	A&E, GP, OOH, WiC, England	Prospective case review and routine data	To compare the populations of patients presenting to various acute care facilities.	Random samples from ED between 0800-2200. 384 A&E self-referral attendances excluding ambulance retrievals compared to routine data of contacts from GP OOH (343), GP same day appointments (165) and WiC (300). OOH and GP patients were older and more were female compared to those attending A&E and WiC. A&E associated with chest pain and injuries, non-A&E sites associated with infections and non-traumatic musculoskeletal problems. Half of patients self-referring had further assessment/ investigations not available in non-A&E settings. Note timing of sampling of patients was not explicitly OOH.
(Zhou et al., 2015)	GP services, England	Questionnaire	To assess the relationship between patient reported GP access and the use of OOH.	567 049 surveyed patients with GP contact in last 6months, 40 108 (7%) of whom accessed OOH in last6 months. Crudely, worse patient reported measures of GP access associated with increased OOH use. After multivariate analysis some association lost but strongest association remained between convenience of opening hours and OOH use and some association for other measures. Estimate an

				11% reduction in OOH use if all patients adjusted to have optimal access. Note this assumes a causal relationship. Other limitations – self reported access, ‘endogeneity’
(Cook et al., 2015)	NHS Direct, England	Routine data analysis	Characterise the calls to telephone triage service that were then referred on to other services.	1,385,457 calls over 4 months in 2010-2011. 269,558 (19%) were urgent, and more urgent calls between 15:00-23:00 (all ages) and during bank holidays and weekends (adults only) than other times. Males, most deprived, 60+, more likely referred to urgent care. Associations were found between symptoms and urgency as well as ethnicity and urgency.
(Smits et al., 2015)	In hours GP and GP OOH coops, The Netherlands	Routine data analysis	To compare the characteristics of 100 GP practices and their associated level of out of hours use.	100 GP practices’ data analysed over 1 year (2011-2012). Half the practices labelled as high use remainder as low use. High use mean OOH contact rate 1.8 x higher than low use group (369 vs. 204/1000/yr). High OOH use practices had higher percentage of foreigners, 0-4yr olds, were closer to co-op, had longer telephone waiting times, had GPs less available for palliative care, performed more tests, had higher perceived workload and had more assistants working. Note no data available on practice population health, small numbers mean chance may play a role in significant results and telephone accessibility was measured 11 months after data collection.
(Elliott et al., 2015)	Telephone triage, Scotland	Routine data analysis	To examine how the public use the telephone triage system to manage symptoms and health problems through analysis of	1 yr, 2011, worth of national call data. 1 285 038 calls with ID number of which 1 061 347 (86%) were OOH. 791 178 individual users. 83% of calls assigned a problem. Abdominal

			symptom/problem type, duration of symptoms and call outcome.	problem most common (12.2%), dental (6.8%), skin (6%). Most were abdominal (13.2%), skin and breathing problems OOH compared to dental (37.2%), abdominal and medication problems in hours. 70% had information on symptom duration - 63% were <24h duration and those OOH tended to be of shorter duration. OOH outcome – advice to visit Ooh centre 34.1%, HV 12.2% and self-care advice 10.2% In hours outcome – advice to see dentist 27.6%, clinician call back 21.1%, advice to contact own GP 19.2%. Of OOH users compared to in-hours users higher proportion were female, younger or older, more deprived or more remote areas. Older and more deprived less likely to use service in total.
(Buja et al., 2015)	OOH service, Italy, 2011	A retrospective cohort study	To describe the characteristics of patients contacting OOH and to analyse the related outcomes.	23,980 contacts in 12 months. Contact rates highest for older and younger age groups and higher for females. 52% were examined by a GP at home or at the walk-in clinic, 38% were managed over the phone and 9 % were referred to hospital. Factors, including demographic variables, process-logistic variables and clinical characteristics of the contact, were associated with the outcome. Certain OOH physicians were more likely than their colleagues to refer a patient to an ED.
(Chodos et al., 2015)	A&E and GP Cooperative, Switzerland	Prospective case review	To compare the characteristics of walk-in patients in A&E with walk-in patients at GP cooperative.	1901/2974 patient encounters were walk-ins (A&E 1133, GP-C 768). Patients consulting the GP-C were older, more often female and presented with non-injury related medical problems. Walk-in distribution in both settings

				was equal over a period of 24 hours and most common during daytime hours (65%).
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**Table A2. Papers dealing with IT and information sharing**

<b>Citation</b>	<b>Setting</b>	<b>Study Design</b>	<b>Aim</b>	<b>Key Findings</b>
(Brumley et al., 2006)	OOH hospice care; Australia	Action research approach	To improve access to clinical information for nurses and doctors providing after hours community palliative care in a regional Australian setting.	One page information sheet held on the service's computer update daily. Hospice nurses access record via a hand held Palm Pilot; nurses' reported increased confidence dealing with these palliative patients. Note: Lack of data from patients' GPs or from patients themselves.
(Jones et al., 2009)	Population-level; Scotland	Economic analysis	An economic analysis of the emergency care summary (ECS) implementation in Scotland	Annual benefits exceeded annual costs after 7 years. Approximately 77% of benefits were non-financial (patient safety, reduced exposure to risk, time savings); 23% benefits from redeployed finances. Initial high costs associated with mailing every household in Scotland to explain ECS. Main beneficiaries were Scottish population and NHS Health Boards. Note: Lack of detail on methods employed.
(De Bock et al., 2011)	OOH service: The Netherlands	Mixed methods	To investigate how frequent information is transferred on patients receiving palliative care from GPs to the out-of-hours services, to explore the perceptions of GP's on this information transfer and to study the relation between information transfer and the	In 3 months, 722 (7.5%) contacts with OOH service for 338 palliative patients. Cancer most common palliative condition. Transfer of information from in-hours to OOH occurred for only 20% of patients. Where information was transferred, tended to by fax or via

			used GP information systems.	digital information system.
(Morris et al., 2012)	Clinicians (nurses, nurse advisors, pharmacists) working in NHS 24; Scotland	Questionnaire	To assess use and acceptability of the emergency care summary (ECS)	Use has steadily increased since launch in 2006; used most by clinicians in NHS 24. Few patients refuse permission to access record. Clinicians surveyed (39.3% RR) viewed ECS positively; changed management decisions in 20% of cases. Some mismatch between ECS and patient's recollection of medicines. Note: Patient view not assessed.
(Hall et al., 2012)	Patients, carers & OOH staff; Scotland	Qualitative	To identify key issues related to the introduction of electronic Palliative care Summary (ePCS) from primary care and OOH staff, to identify facilitators and barriers to their use, to explore the experiences of patients and carers and to make recommendations for improvements.	ePCS viewed positively by all, although best suited to needs of cancer patients. Patients and carers reassured that OOH staff have up-to-date information; OOH feel better informed to make decisions about patient. GPs felt ePCS improves advanced care planning in in-hours period. Barriers: unfamiliarity with process, limited time and IT skills. Confidentiality not raised as an issue.
(Ali et al., 2013)	GP OOH co-operative; Scotland	Retrospective case review	We hypothesised that the availability of a palliative care summary for individuals with established cancer would influence emergency hospital admission during the out-of-hours period.	401 patients with established cancer presenting to OOH co-operative; 35.7% had palliative care summary. 100 patients admitted to hospital. Not having a palliative care summary made hospital admission significantly more likely.
(Craig et al., 2015)	GP practices & OOH clinicians; Scotland	Mixed methods	This evaluation identified the impact of key information summary (KIS) on healthcare services.	Clinicians viewed key information summary (KIS) positively. KIS believed to enhance patient safety & improve communication. KIS also thought to reduce hospital admissions and be acceptable to patients; although no

				objective evidence to support either claim.
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**Table A3. Papers dealing with quality and safety of care**

<b>Citation</b>	<b>Setting</b>	<b>Study Design</b>	<b>Aim</b>	<b>Key Findings</b>
(Kristoffersen, 2000)	Norway; OOH service, 531 patients who died within the 1 yr study period	Prospective case review	To assess how and to what extent out-of-hours primary care facilities care for patients who die shortly afterwards, and whether information about deaths and causes of deaths are fed back to doctors who treated the deceased persons.	134/531 deceased patients had an OOH service in last 4 wks of life. Patients generally over 70; cancer accounted for 23.7% of deaths. OOH doctor notified of death and cause in only 7 (6%) of cases Overall, 6 cases were OOH doctor may have misinterpreted condition, possibly leading to delay – these tended to be cases with unusual or complex symptoms.
(Shipman et al., 2000a)	England; General practice. 715 GPs and 317 district nurses	Questionnaire/Survey	To explore the views of GPs and DNs in eight health authority districts of out-of-hours palliative care provision.	448/715 GPs (RR 68.3%) and 204/317 DNs (RR 64.4%). 65% of GPs and 45% DNs were satisfied with OOH care. Few GPs routinely passed on information on their palliative care patients, particularly to GP co-operatives. DNs and inner city GPs were least satisfied with aspects of OOH care. Most responders wanted 24-hour availability of specialist palliative care.
(Munday et al., 2002)	UK; OOH care. Medical directors of 174 OOH co-ops; Medical directors of 224 specialist palliative care units.	Questionnaire/Survey	To describe general practitioners' and specialists' perspectives on the availability and scope of community nursing and specialist palliative care services.	133/174 co-op directors (RR 76%); 182/224 palliative care units (RR 81%). Wide variation in access to community nursing and palliative care services OOH. GPs were much less positive than the specialists about the availability of specialist advice and admission to

				specialist units OOH.
(King et al., 2003)	England; OOH general practice. GPs and district nurses	Qualitative study	To evaluate an out of hours protocol for palliative care	Practitioners felt the OOH protocol had made a positive contribution of palliative care in the community; the OOH handover form was key to improving communication and co-ordination of services. The protocol encouraged a more anticipatory approach to care and enabled better access to drugs and specialist advice.
(Burt et al., 2004)	England; 4 OOH co-operatives. 13460 patient contacts	Retrospective case review	This study investigates the current use of information handover systems for palliative care patients within four out-of-hours co-operatives.	279 (2.1%) calls were for palliative care patients, representing 183 patients. 24 (13.1%) of patients had a handover form; this varied from 1 (1.2%) to 13 (32.5%) patients. Authors suggest handover systems are under-utilized.
(Kerr et al., 2006)	England & Wales; Hospital managers and senior nurses	Questionnaire/Survey	To examine existing arrangements for out-of-hours medical cover in community hospitals, focusing on palliative care.	Nursing staff were satisfied with OOH care. There was concern about future OOH care from GPs as new services would cover larger areas; there were concerns that unknown GPs might attend patients and take longer to arrive.
(Price et al., 2006)	UK; Complaints and claims to Medical Protection Society	Routine data analysis	Study purpose is to assess the impact of recent changes to out-of-hours primary care services.	Changes to OOH care has led to a number of emerging risks. Problems with GP communication skills most frequently occurring factor in OOH incidents.
(Giesen et al., 2007d)	The Netherlands; 3 panels of GPs (n=15)	Delphi	Development of a set of quality indicators for internal quality improvement in out-of-hours primary clinical care.	Derived a set of 24 indicators for use in quality improvement of OOH care. Indicators categories according to clinical condition; 22 relate to

				prescribing; 2 to referral management.
(O'Cathain et al., 2007)	Scotland; NHS 24. 464 nurse advisors	Questionnaire	This study was undertaken to explore the effect of nurses' attitudes to risk on the decisions they make when using CDSS.	RR of 57% (265/464). 16% of calls sent to self-care, but this varied 3-fold between top and bottom deciles of nurses. Attitudes to risk varied greatly between nurses. After adjusting for case-mix, weak evidence to suggest nurses' attitudes to risk affected decision-making.
(Calnan et al., 2007)	England; OOH general practice. 15 GPs	Qualitative study	To explain why there are marked variations in hospital referral rates for GPs working in out-of-hours care.	Interviewed GPs with high, medium and low OOH referral rates to hospital. High referrers more cautious believe it is better to admit if in doubt and worry about possible consequences of not referring. Low referrers more confident about their decisions and worry less afterwards. Low referrers see hospitals as places to avoid and have the goal of preventing admission.
(Thomas, 2009)	England, OOH service	Participatory action research	What helps to avoid hospital admission of patients who want to die at home when a crisis occurs in the OoH period?	Several factors identified to help avoid undesirable hospital admissions: 1. Register of vulnerable adults; 2. Records at home; 3. Key worker(s); Home interventions; 5. Day-time practitioner communication; 6. Development and governance group; 7. Speedy discharge from hospital; 8. Decision support for OOH GPs.
(Schweitzer et al., 2009b)	The Netherlands; GP co-operative. 137828 patient calls	Retrospective case review	We conducted a study to assess the availability, content and effect of information transferred to the GP co-operatives.	1041 (0.75%) of calls for palliative care patients. Information transferred by GPs on 25.5% of palliative care patient calls, and 12% from residential care

				homes. For terminally ill patients the number of information transfers increased to 28.9%. Content consisted mainly of clinical data. Information about the diagnosis and current problems transferred in more than 90% of cases; information about the patient's wishes in 45%; on patient's psychosocial situation in 30.5% of cases.
(Schweitzer et al., 2009a)	The Netherlands; general practice. 424 GPs	Questionnaire/survey.	To investigate the views of general practitioners (GPs) on the transfer of information about terminally ill patients to the GP co-operatives.	177/424 GPs (RR 42%). Transfer of information to GP co-operative about most of their terminally ill patients was reported by 82% of GPs. A faster than foreseen deterioration of patient's situation was the most frequently reported reason for not transferring information. Of those who transferred information to the GP co-operative, more than 95% reported that they provided information about the diagnosis and terminally ill status of the patient. Information about medication, patient wishes regarding treatment, and prognosis was reported by respectively 90%, 87%, and 74% of the GPs. Fewer than half transferred information about the patient's awareness of both the diagnosis and the prognosis, about the psychosocial context, and intolerances. 21% worked as an OOH locum. In this

				role, over 90% wanted to receive information about the diagnosis, the terminally ill status of the patient, the medication and the patient's wishes regarding treatment.
(Taubert and Nelson, 2010b)	Wales; OOH co-op operated by Serco. 60 GPs	Qualitative study	To explore factors GPs identified as detrimental or beneficial for good communication between themselves, patients, relatives and other professionals, specifically to palliative care encounters.	9 GPs employed by Serco interviewed. GPs described constraints within the system provided by the local private company which owned the OOH service. A strong feeling of 'being alone out there' emerged, with some GPs more willing to call for help than others, and others expressing their concern at access to pharmacies and medication being very inconsistent. OOH GPs felt left alone on occasion, unable to access daytime services and not knowing who to call for advice. Information hand-over systems from in-hours to out-of-hours with regard to palliative care were felt to be inadequate. Out-of-hours doctors interviewed felt left out of the care loop; handover sheets from specialist palliative care providers were a rarity.
(Coleman and Nicholl, 2010)	England; wide range of clinical groups and managers	Delphi	To identify a comprehensive set of indicators to enable Primary Care Trust (PCT) commissioners in England and other NHS decision-makers to monitor the performance of systems of emergency and urgent care	Identified 16 candidate indicators, including mortality outcomes; process indicators (e.g. time from first contact); distance to emergency/urgent care facility; equity indicators. Also defined a set of serious, emergency and urgent care-sensitive conditions.

(Fergus et al., 2010)	Scotland; OOH care. GPs, DNs, NHS 24 advisors, other PC practitioners, patients & a carer.	Qualitative study	To identify key challenges and improvements to out-of-hours palliative care in a mixed urban and rural deprived area.	Key issues identified: importance of good communication between sectors and having information available; the unwieldy process of accessing medical care OOH; professionals bypassing routine OOH care for palliative patients; OOH care provided by practitioners unaware of local services. Authors recommend use of a “special note” for palliative patients, completed early in course of illness and updated regularly. Also suggest that it should be possible to bypass NHS 24 for such patients.
(Taubert and Nelson, 2010a)	Wales; OOH co-op operated by Serco. 60 GPs	Qualitative study	To explore factors influencing confidence in dealing with symptom control and palliative care provision outside regular working hours.	9 GPs employed by Serco. GPs had concerns about the constraints within an OOH system operated by a private company. Other issues were: concerns about lack of continuity; inadequacy of notes and follow-up; need for more education on palliative care. Pressure from the OOH provider to see more patients felt at odds with need to spend time with this vulnerable group. Many GPs felt isolated and that patients didn't want them, but instead wanted specialist palliative services.
(Smits et al., 2010)	The Netherlands; OOH general practice co-operatives. 1145 patient records	Retrospective case review	To examine the incidence, types, causes, and consequences of patient safety incidents at general practice cooperatives for out-of-hours primary care and to examine which factors were associated with the occurrence of	27 patient safety incidents identified, incident rate of 2.4%. Most did not result in actual patient harm. Most frequent incident type was related to treatment (56%).

			patient safety incidents.	
(Thomas et al., 2010)	England; Practice-based CG including in-hours and OOH organisations	Participatory action research	To investigate what promotes good communication between Community Matrons, GPs and OOH services to ensure that the right patients are case managed and hospital admissions are avoided.	Stakeholders agreed that standards should be adopted to improve communication between matrons, GPs and OOH services. Strategies could include improved IT systems to transfer information; Special Patient Notes with named professionals; case meetings between matrons and GPs; and monitoring of routine data.
(Schweitzer et al., 2011)	The Netherlands; general practice. 27 GPs	Qualitative study	To investigate the experiences of GPs in the Netherlands about the quality of out-of-hours palliative care provided by GP co-operatives, and to identify elements of care that might need to be improved.	GPs considered the quality of care provided by OOH co-operatives for palliative patients to be poor. Service perceived to be designed for acute medical problems, not palliative care needs. Issues included: lack of adequate information at the GP OOH service; lack of anticipatory care during daytime hours; absence of a palliative care policy in the GP co-operatives.
(Zwart et al., 2011)	The Netherlands; 3 OOH services	Quasi experimental	To compare the number and nature of incident reports collected in a local incident-reporting procedure (intervention) versus the currently used centralised incident-reporting procedure.	Local incident reporting led to a 16-fold increase in the number reported compared with previously centralised system. Type of incidents reported did not change. Local system saw change implemented faster; central system resulted in more systematic addressing of problems. Authors suggest advantages of both systems should be combined.
(Taubert et al., 2011)	Wales; OOH co-op operated by Serco.	Qualitative study	To determine aspects of care provision that augmented or challenged palliative	9 GPs interviewed. OOH doctors not confident about their palliative care

	60 GPs		care delivery.	knowledge and wanted more education. Lack of familiarity with the patients was seen as a problem, as was lack of follow-up. Fear of harming patients with the strong drugs being used was a concern. Opiophobia, especially in patients they see only once, affected prescribing decisions.
(De Bock et al., 2011)	The Netherlands; OOH primary care	Mixed methods	To investigate how frequent information is transferred on patients receiving palliative care from GPs to the out-of-hours services, to explore the perceptions of GP's on this information transfer and to study the relation between information transfer and the used GP information systems.	Only 20% of palliative patients contacting OOH had a transfer of information available; only half of these transfers included an anticipating end-of-life plan. GPs considered continuity of care important, but some doubted that information exchange was relevant for quality.
(Giesen et al., 2011)	The Netherlands; After-hours primary care	Narrative review	A narrative review of studies on a range of issues about after-hours primary care in the Netherlands, including experiences of health care professionals and patients, patient-safety incidents, adherence to practice guidelines, waiting times, and quality of telephone triage.	Patient safety incidents identified in 2.4% of all contacts; most did not harm the patient. Adherence to clinical guidelines by doctors was 77%; lowest adherence for prescribing antibiotics and treatment in emergence cases.
(Balla et al., 2012)	Oxford, UK; 21 GPs	Qualitative	To examine clinical reasoning and decision making in an out of hours (OOH) primary care setting to gain insights into how general practitioners (GPs) make clinical decisions and manage risk in this environment.	GP clinical decision making dominated by rule-out strategies for severe illness or potentially high-risk diseases. Three main criteria for case closure: exclusion of sever/high risk disease; patient's needs met; reliable safety net in place. Improvements could include routine

				feedback to clinical staff; peer and expert clinician support; more tailored GP training. Also implications for training of trainees.
(Sandvik et al., 2012a)	Norway; 415 physicians in OOH emergency service	Routine data analysis	To evaluate whether immigrant and native Norwegian doctors differ in their practice patterns	21.4% of doctors were migrants, with 30.6% of patient contacts. Migrant doctors from Asia, Africa and Latin America did more OOH compared with Norwegian doctors (633 contacts vs 306 in 1 year). Migrant doctors wrote more sickness certificates per consultation; otherwise only minor differences in practice between the two groups.
(Asprey et al., 2013)	England; OOH primary care service. Involved 29 OOH and daytime GPs and nurses; 8 palliative care patients & carers	Action research	To work with service users and providers to optimise the design and implementation of handover forms to support the transfer of information between daytime and out-of-hours primary care services for patients with palliative care needs.	Use of handover forms and handover practice was inconsistent. Changes implemented: automatic reminders to daytime practice before handover form expired requesting update/check; online access to form for all OOH staff improved; call operators trained to give verbal messages to GPs/nurses on mobile teams; educational materials to promote handover forms sent to all daytime practices.
(Kiely et al., 2013)	Ireland, general practices. 414 GPs.	Questionnaire/Survey	To investigate the opinion of GPs on the potential value of a formalised method of information transfer regarding their palliative patients to out-of-hours GP co-operatives.	214/414 (RR 52%). 82% of GPs did not routinely transfer information about their palliative patients to the OOH service. However, 96% wanted a standardised way of transferring information. Areas of information required were: diagnosis, medications, patient insight, patient wishes about

				end-of-life care, anticipatory care plan.
(Donnellon et al., 2013)	England	Mixed methods	To analyse the effect on clinical practice of auditing doctors, advanced nurse practitioners and pharmacist consultations within an out of hours primary care organisation and the resultant effects this may have on clinical practice and the quality of care provision.	Implementation of the RCGP OOH audit tool associated with improved GP performance against the performance criteria, although sustainability may be difficult. Improving performance also seen for advanced nurse practitioners and pharmacists.
(Bondevik et al., 2014)	Norway; 316 GPs & 194 nurses working in OOH clinics and GP practices	Questionnaire	To investigate patient safety attitudes amongst health care providers in Norwegian OOH primary care	52% response rate; nurses scored higher than doctors, older health professionals scored higher than younger, male GPs scored higher than female GPs, and health professionals in GP practices scored higher than those in OOH clinics – on several patient safety factors (e.g. teamwork climate; safety climate). Authors suggest variations in views need to be addressed, and that the potential of “poorer” patient safety on OOH situation needs investigated.

**Table A4. Papers dealing with call triage**

<b>Citation</b>	<b>Setting</b>	<b>Study Design</b>	<b>Aim</b>	<b>Key Findings</b>
(Court et al., 1996)	England; 720 GPs and 16 GP registrars.	Questionnaire/Survey	To identify the main factors which influence general practitioner principals when making decisions about requests for out of hours visits and to find out whether they would welcome guidelines.	72% response rate; definition of OOH timeframe started at 7pm weekdays and 1pm Saturdays. Most important factors influencing decision for home visit was urgency – caller saying it was urgent or GP worry about missing something urgent.
(Dale et al., 1998)	England; OOH triage and advice service in general practice. 10,188 calls.	Routine data analysis	To evaluate an out-of-hours telephone triage and advice service in general practice.	Service used telephone assessment software (TAS) and nurses received training. 25 nurses took a mean of 407 calls (range 123-918). Mean length of call was 6.73 minutes. Calls used 111 of the assessment pathways; 30 pathways accounted for 90.6% of assessed symptoms. 5009 (49.2%) of callers were advised to see a doctor face-to-face, either at centre, in A&E or by home visit. Remaining 50.8% given nurse advice, including self-care or to consult own GP in daytime hours. There was variation in call outcomes across the triaging nurses, although no explanatory variables to try to understand this.
(Lattimer et al., 1998)	England; GP OOH co-operative 14492 contacts for 10134	RCT	To determine the safety and effectiveness of nurse telephone consultation in out of hours primary	Intervention: Management of calls by trained triage nurses vs GPs taking the calls.

	patients		care by investigating adverse events and the management of calls.	Of the 14492 contacts, 7308 in the control arm and 7184 in the intervention arm. No substantial differences in the age and sex between the groups; male patients underrepresented overall. Reasons for calling the service were consistent with previous studies (though not stated). Nurses managed 49.8% of calls during intervention periods without referral to a GP. During intervention periods: 69% reduction in telephone advice from a GP; 38% reduction in patient attendance at primary care centres; 23% reduction in home visits. No difference in number of deaths within seven days, in the number of emergency hospital admissions, and in the number of attendances at A&E. Concluded that nurse triage safe and effective.
(St George et al., 2003)	New Zealand; OOH call centre. 36,465 calls	Mixed methods	To report call centre-based telephone triage OOH to a rural medical centre.	Compared calls from rural area with rest of region. Demographics and reason for call similar to region as a whole. Rural callers more likely to be triaged to higher level of care, although 2/3 were triage to lower levels of care that did not require a doctor.
(Zeitz et al., 2006)	Australia; after hours primary care. 23 rural communities; 21	Qualitative	To report on the issues highlighted by clinicians in providing after-hours primary medical care in rural and remote communities.	Issues raised by clinicians working in rural and remote OOH care included: community expectations; systems of care; scope of nursing practice and need

	hospitals; 80 GPs & 200 nurses.			for triage CPD; private practice/public hospital interface; and medico-legal issues. Areas for priority action inc: better communication and collaboration between hospital staff and GPs; community education around appropriate use of after-hours care; education and support for nurses.
(Hildebrandt et al., 2006)	USA; family medicine residency office. 4949 calls, of which 2835 after-hours.	Retrospective case review	To assess and categorize harm occurring to patients who called their physicians' office after-hours but did not have their call forwarded to the physician because they stated that their call was not an emergency.	Evaluated calls to a family practice's answering service. 2835 (57.0%) of calls were after-hours; 228 were not forwarded to physician on-call because caller said it was not an emergency. In following 2 weeks, 51% had office visit, 4% ED visit and 2% admitted to hospital. 3% suffered harm and 26% discomfort during the delay. 66% required no intervention. Authors conclude that there is the potential for serious harm in cases where call not passed on.
(Moll van Charante et al., 2006)	The Netherlands; GP OOH co-operative. 1421 calls	Prospective case review	To explore which determinants are associated with nurse telephone advice alone (NTAA) and with subsequent return consultations to the GP.	Of 1421 calls, 391 (27.5%) handled by nurse alone; remaining 1030 (72.5%) had GP contact (telephone advice, centre or home visit). NTAA ranged from 15.5% to 39.4% across the 8 nurses; higher during the night (RR 1.63); lower with increasing age (RR 0.96 per 10 years), or with multimorbidity (RR 0.65 for >2 conditions). NTAA highest for earache and lowest for chest pain. More return calls if initial NTAA call had been at

				night; but no evidence of increased referral to hospital following NTAA call. Authors suggest variability might indicate s in perception on tasks and/or differences in skill to handle telephone calls alone.
(Giesen et al., 2007a)	The Netherlands; GP OOH co-operatives. 352 contacts	Simulated patients study	To investigate whether triage nurses accurately estimate the urgency level of health complaints when using the national telephone guidelines, and to examine the relationship between the performance of triage nurses and their education and training.	Triage nurses decisions assessed by 7 GP experts (no detail given). Nurses assessed urgency correctly in 69% of 352 contacts; underestimated urgency in 19% of contacts. Significant correlation found between correct estimation of urgency and training on use of national guidelines to assess urgency by telephone. Authors conclude that telephone triage by nurses is effective but that training is recommended. Also recommend a second safety check by a trained GP telephone doctor.
(Derkx et al., 2009)	The Netherlands; 17 GP OOH co-operatives. 357 contacts	Simulated patients study	To assess the quality of communication skills of triagists, working at out-of-hours (OOH) centres, and to determine the correlation between the communication score and the duration of the telephone consultation.	Mean overall score for communication skills was 35% of the maximum feasible; scored highest in history taking. Triagists usually asked questions about the clinical situation correctly, but little about the patients' personal situation, perception of the problem or expectation. Advice about the outcome of triage and self-care advice was usually given without checking for patients' understanding and acceptance

				<p>of the advice. Calls were often handled in an unstructured way, without summarizing or clarifying the different steps within the consultation. Positive correlation of 0.86 (<math>p &lt; 0.01</math>) between the overall communication score and the duration of the telephone consultation. Authors conclude training in telephone consultation should focus more on patient-centred communication with active listening, active advising and structuring the call, but also need sufficient time for telephone consultation to enable high quality performance.</p> <p>Note: No clear description of background of triagists, but probably nurses.</p>
(Lordan, 2009)	Ireland (Republic and NI); OOH primary care co-operatives. 19 co-operatives; 35,523 contacts	Routine data analysis	To investigate whether service provision was consistent across co-ops once patient characteristics, patient complaints and other covariates were controlled for.	Results suggested care provided was relatively homogenous across all co-operatives.
(Turnbull et al., 2011)	England; GP OOH co-operative; 34226 calls	Routine data analysis	To examine the effect of distance and rurality on the doctor's decision to manage the call by telephone or face-to-face.	For patients calling within 6km of a primary care centre, telephone advice only increased with increasing distance from the centre. For patients seen face-to-face, the likelihood of a home visit increased with increasing distance. Authors suggest that providers must configure services to ensure

				geographical equity of access, regardless of distance from a centre.
(Hansen and Hunskaar, 2011)	Norway; OOH casualty clinics. 116 nurses	Case scenarios	To evaluate decisions on degree of priority made by nurses in out-of-hours service in Norway using written case scenarios.	83/116 nurses responded (76%). 90% were registered nurses. 82%, 74% and 81% of acute, urgent and non-urgent scenarios were correctly classified according to nation guidelines. Overall, 18% of cases over-triaged; 12% under-triaged. No difference across casualty clinics, by profession (registered nurses vs others) or by experience.
(Huibers et al., 2011a)	Multiple countries; OOH primary care	Systematic review	To assess the research evidence on safety of telephone triage in out-of-hours primary care.	Included 13 observational studies. Triage was safe in 97% (95% CI 96.5 - 97.4%) of patients contacting OOH care; safe in 89% (95% CI 86.7 – 90.2%) patients with high urgency. 10 studies examined high risk simulated patients: triage safe in 46% (95% CI 42.7 – 49.8%). Adverse events included death (reported in 6 studies), hospitalisations (in 5 studies), attendance at A&E (1) and medical errors (6). Authors suggest room for improvement in patients who present as high risk.
(Huibers et al., 2012a)	The Netherlands; GP OOH co-operative. 304 contacts	Simulated patients study	To examine the relationship between comprehensiveness of history taking and appropriateness of urgency estimation.	Mean number of discriminating questions (designed to assess urgency) and general questions per telephone contact were 4.4 and 3.2. No difference in number of discriminating questions asked for contacts with correctly estimated urgency and those with underestimated urgency. Clusters of

				frequently asked questions identified. Authors conclude pattern recognition may be more important in assessing urgency of call.
(Huibers et al., 2012b)	The Netherlands; 29 GP OOH co-operatives; 6739 nurse telephone contacts from 623 triage nurses	Routine data analysis	To explore the impact of quality of consultation and estimated urgency on the appropriateness of decisions.	Analysed 6739 nurse telephone contacts; 90% were non-urgent. Most decisions deemed appropriate (91% for urgency, 96% for follow-up advice, 95% for timing. Triage nurses over-estimated urgency in 18 (18.8%) of level 1 life-threatening calls; under-estimated urgency in 251 (7.1%) of level 4 non-urgent calls. Higher quality of consultation associated with more appropriate estimation of urgency, follow-up advice and timing of decisions. Quality of consultation needs to be targeted in training and support of triage nurses, especially in relation to the small number of highly urgent contacts.
(Mohammed et al., 2012)	England; OOH GP co-operative. 128,717 telephone consultations	Retrospective case review	To determine the factors which influence telephone consultation	Overall mean call length was 7.78 minutes (standard deviation (SD) 4.77). Calls for advice only were longest (mean 8.11 minutes, SD 5.17), followed by calls which concluded with a base visit (mean 7.36 minutes, SD 4.08) or a home visit (mean 7.16 minutes, SD 4.53). Two primary factors influenced call length. Calls by GPs were shorter (mean 7.15 minutes, SD 4.41) than those by NPs (mean 8.74 minutes, SD 5.31) and calls

				designated as a mental health call were longer (mean 11.16 minutes, SD 4.75) than all other calls (mean 7.73 minutes, SD 7.7).
(Pasini et al., 2015)	Italy; OOH call centres staffed by doctors. 40 calls	Simulated patients study	To evaluate the quality of telephone triage and the appropriateness of the decisions resulting from it at a primary care out-of-hours service.	A set of compulsory questions, to be asked in every call, were only used in 27-36% of calls. In 3 calls, which should have been manageable by telephone, patient was asked to attend an outpatient clinic. Overall, quality of triage was low.

**Table A5. Papers dealing with GP training**

Citation	Setting	Study Design	Aim	Key Findings
(Longhurst et al., 1998)	England; OOH primary care. 104 GP registrars	Mixed methods	To identify the opinions of GP registrars with regard to out-of-hours care and to describe potential ways of improving training.	64/104 (RR 67.0%). 47 (73.4%) worked in practices that belonged to an OOH co-operative. Mean number hours per month call 10.4hr; those in practice which handed care over to OOH practice, mean = 6.6hr pm; those in non-cooperative practices, mean = 16hr. Lower levels of confidence providing telephone advice cf doing home visits. Issues inc: lack of confidence in determining seriousness of the complaint (30%); difficulty in managing expectations for home visit; fear of litigation. Solutions inc role play, tutorials, written guidelines, listening to trainers give telephone advice. Need for more information about other agencies e.g. social services, CMHTs and community nursing also raised.
(McKinstry, 2000a)	Scotland; OOH co-operative. 5576 contacts; 51 GP registrars; 52 trainers.	Log diaries	To compare the confidence in managing out-of-hours problems of registrars in traditional on-call rotas and co-operatives with that of their trainers.	Reviewed decisions made regarding OOH contacts at 2 time-points: in winter (when registrars recent starts); and in summer (when registrars more experienced). Registrars confident in their management of patients and this increased over the year (59% to 72%). They varied in their discussion of

				problems with their trainers, discussing management in 57% of cases when “a little worried”, but only 6% of times when “very confident”. In the summer period, GP registrars referred more frequently to hospital than their trainers did; reasons unknown.
(McKinstry, 2000b)	Scotland; OOH co-operative. 5576 contacts; 51 GP registrars; 52 trainers.	Log diaries	To explore the experience of registrars in out of hours services	Marked variation in individual workloads, but in general most registrars were exposed to a reasonable level of experience. There were no major differences between the experiences gained in traditional and co-operative models. Night-work, while providing fewer overall contacts, was a valuable source of experience of more serious problems.
(Kenny, 2004)	England; GP trainees and principals	Course evaluation	To assess three courses designed to develop skills in consultations at a distance	Course increased confidence in telephone consultations in daytime and OOH scenarios.
(Mamelok, 2005)	England; 115 GP trainers; 117 GP registrars	Questionnaire/Survey	To assess the most important objectives for out-of-hours training.	88 trainers (RR 76%) and 42 registrars (36%). Most trainers (63%) uses a co-operative, with 41% doing 1 or 2 sessions pm. GP registrars more variable - 19% did 12 sessions per year (1 pm); 21% did 20 sessions per year. Most trainers indicated they would drop OOH commitment when 2004 GMS contract implemented. Both trainers and registrars concerned about how OOH care would be provided post contract. Both groups favoured a standardised

				model of OOH training, with clear curriculum and competency assessment. Many registrars questioned relevance of OOH training given changing agenda for primary care.
(Owen et al., 2008)	England; Medical students, GP tutors, GP Heads of Depts	Questionnaire/Survey	To determine the current experience gained by medical students in general practice out-of-hours, the feasibility of providing out-of-hours teaching and opinions about its value.	69 medical students (RR 71%): 16 (23%) had experienced OOH teaching during their GP attachment. 113 GP tutor (RR 78%) replied; almost 50% felt they could offer OOH teaching. 27/29 UK GP departments replied: OOH teaching was compulsory on 2 medical schools; provided in an ad hoc basis in 12; not provided in 13 schools. Authors estimate that, on basis of these results, about 18% of UK medical students are exposed to GP OOH training.
(Lewis et al., 2009)	Wales; 120 GP registrars	Questionnaire/Survey	To explore the perceptions of GP registrars about the quality of the training that they receive within out-of-hours (OOH) settings.	70 replied (RR 58.3%); fewer respondents from rural areas. Most worked for larger OOH providers (although not defined). Most felt positive about the supervision they received during OOH sessions and it meet their competency needs.
(Khatriya et al., 2010)	England; 11 GP Registrars	Qualitative study	To evaluate the impact of exposure of GPRs to a structured NHS Direct educational experience as a professional development activity.	GP registrars evaluated a simulated training experience at an NHS Direct centre. GPRs valued the experience, reported that it promoted interprofessional learning increased their understanding of NHS Direct's place in the wider health care system, and allowed them to reflect on their

				<p>own professional development. Success factors were a well-planned and interactive session allowing registrars to experience “real-life” scenarios and role play protocol-led problem-solving activities.</p> <p><b>N.B.</b> Registrars not exposed to live sessions.</p>
(Johnston et al., 2013)	Northern Ireland; ST2 & 3 GP trainees, recently completed GPs and OOH supervisors	Mixed methods	To evaluate how confident GP trainees were with OOH training	<p>RR of 55% ST2, 46% ST3 and 50% for former trainees. 93% had completed evening sessions and 63% overnight sessions.</p> <p>92% of current trainees intended to work in OOH one qualified (although no indication of level of commitment); 65% of former trainees were working in OOH.</p> <p>37% did OOH sessions with their own trainers, 22% with another trainer and 40% with a clinical supervisor.</p> <p>Satisfaction with training was high as was their self-rated confidence in providing OOH care.</p> <p>Trainers felt provision was variable, citing communication between clinical supervisors and daytime trainers as an issue at times. Providing OOH services and OOH training also a tension for trainers, as it impacted on the number of patients they could deal with in the OOH session.</p>
(Hayward et al., 2015)	England; 1091 GP	Questionnaire/Survey	To understand GP trainees' experience	271/1091 (RR 25%). Respondents

	trainees		of out-of-hours (OOH) training in England	<p>completed a median of 10 shifts (range 0-30). In 21% of shifts, respondents had only observed; in 57% of shifts, respondents worked under direct supervision of a qualified GP; in 22%, supervision was remote (e.g. independent home visits with telephone support). 55% had worked in other OOH settings e.g. CMHT, with paramedics, in a walk-in centre.</p> <p>Half had received some formal training on OOH care in their daytime sessions; also in telephone consultations and home visiting. Trainees were more confident in home visits than in telephone triage. 76% intended to work in OOH care once qualified.</p>
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**Table A6. Papers dealing with views of, and impact on, GPs**

<b>Citation</b>	<b>Setting</b>	<b>Study Design</b>	<b>Aim</b>	<b>Key Findings</b>
(Lattimer et al., 1995)	England; General practice	Mixed methods	To determine GP's initial response to the development of GP co-operatives.	10 GPs were interviewed and 96 calls reviewed. GPs suggested that 50-75% of patients calling them OOH could attend a primary care centre, if one existed. 57% of calls were dealt with by telephone.
(Lattimer et al., 1996)	England; general practice. 199 GPs in 2 GP research networks	Questionnaire/survey	To ascertain general practitioners' views about the future provision of out of hours primary medical care	148/199 (RR 74%). 83% of respondents were willing to try at least one service model, with primary care emergency centres the most popular option. Key factors were the potential for a model to reduce time on call and workload and to maintain continuity of care. 91/148 (61%) hoped to reduce time on call' 37/148 (25%) hoped to opt out completely.
(Dale et al., 1996)	England; general practice, health and social services	Mixed methods	To identify the views of users and providers about current arrangements and options for development	Identified dissatisfaction with current OOH arrangements; specific problems related to access, availability, demand for services, and interagency communication. Several areas for development were identified, including the establishment of an out of hours cooperative, multiagency primary care emergency centres, and telephone advice-triage. Many of these are now being planned or piloted.

(Court et al., 1996)	England; general practice. 720 GPs	Questionnaire/Survey	To identify the main factors which influence general practitioner principals when making decisions about requests for out of hours visits and to find out whether they would welcome guidelines	532/736 responses (RR 72%). Most important factor influencing decision to visit was patient, or someone on behalf of patient, saying it was urgent. Next was GP not wanting to miss an urgent condition; third was patient difficulties travelling to be seen.
(Salisbury, 1997a)	England; OOH co-operative or deputising service. 280 GPs.	Questionnaire/Survey	To determine GPs' satisfaction with co-operative and deputising services and explore what determines which they choose to work for.	Overall RR 72.0% (202/280). Co-op: 80.0% (111/139); deputising service: 65.0% (91/141). 56.0% of GPs in co-op had been in a deputising service. 69% of GPs who worked in the co-op also handed their OOH calls to the service; only 24.0% of GPs who worked for the deputising service also handed their calls to it. Co-op GPs were more satisfied, particularly with prescribing quality and with duty doctors' reports. 75.0% of co-op GPs felt it had improved their relationship with local GPs.
(Heaney et al., 1998)	Scotland; OOH co-operative. 36 GPs.	Questionnaire/Survey	To assess GP stress levels before and after formation of OOH co-operative	Number of times on-call fell significantly following establishment of GP OOH co-operative. GP stress levels significantly lower and arousal levels significantly higher in the post-co-operative period.
(Shipman and Dale, 1999)	England; general practice. 25 practices, inc GPs and patients	Mixed methods	To explore the differing perceptions of use of out-of-hours primary care services	98 patients interviewed: 51 received telephone advice, 43 a home visit, 4 attended surgery. GPs judged 46 patients to have urgent physical need, 29 to have urgent psychosocial or social need. Study of

				calls identified mismatch between GPs' perceptions of urgency and need for visit with patients'. Authors suggest that consensus required over what constitutes a primary care emergency and providers need to be more accommodating in defining "appropriate" use. Also need more multidisciplinary working.
(Foster et al., 1999)	England; OOH general practice. 38 GPs	Mixed methods	To assess GPs' concerns and levels of confidence in providing telephone consultations in order to inform the development of a new training course.	33 GPs organised OOH cover through a co-operative, 5 used practice rotas or deputising services. GPs reported low level of confidence in providing telephone consultations OOH. Reasons included: lack of visual clues; lack of information about patient. A perception that "good" OOH doctors completed calls quickly in the co-operative added to this pressure, as did lack of communication about patient outcomes.
(Charles-Jones and Houlker, 1999)	England; OOH co-operative. Participating GPs and spouses/partners	Mixed methods	To investigate whether the setting up of a cooperative was linked to an increase in the morale of local GPs and their families.	GPs and their spouses reported significant improvements across a range of variables including OOH damaging family life; OOH work being stressful; and worries about safety.
(Fletcher et al., 2000)	England; OOH general practice	Questionnaire/Survey	To examine if new out-of-hours co-operatives reduce stress for participating GPs.	Questionnaire to GPs in 1995 (206/349, 59%) and 1998 (253/374, 68%). In 1995 20% of GPs used a co-operative; in 1998, this was 69%. Physical and emotional role, social function, mental health, energy &

				vitality and general health all significantly improved from 1995 to 1998.
(Olafsson and Sigurdsson, 2000)	Iceland; General practice OOH. 96 rural GPs	Questionnaire/Survey	To examine the access, workload, duties, commitments and quality standards of primary care physicians (GPs) resulting from out-of- hours service.	GPs felt that – under normal weather circumstances within 10km – they could reach patients within 30 minutes of being contacted. In remote areas, GPs on call 14 days or more per month. Serious emergencies were rare; GPs wanted regular refresher courses for such situations, including cardiac resuscitation and intubation.
(Cuddy et al., 2001)	Ireland; GPs. 11 rural GPs and their spouses	Qualitative study.	To explore and describe how rural GPs in Ireland perceive and experience out-of-hours care provision	GPs generally satisfied with their OOH work. However, the amount of time devoted to OOH care impinges on family and social time. Key stressors include: locum cover; unrealistic patient expectations; lack of time off; restrictions on family life; interruptions.
(French et al., 2001)	England; OOH general practice. 26 GPs and their patients	Questionnaire/survey.	To compare the relative effects of being on or off duty at night on general practitioners' (GPs') levels of stress, and the satisfaction of their patients with daytime consultations surrounding these nights.	GPs experienced elevated stress levels when on call. Patients seen in daytime practice before and after a night on call were less satisfied than those seen around a night off duty.
(Smith et al., 2001a)	England; general practice. 199 GPs in 2 GP research networks	Questionnaire/survey	To determine the factors that influence GPs' perceptions of the appropriateness or inappropriateness of out-of-hours calls.	146/199 responded (RR 73%). GPs seemed to have well developed (internal) classification of the appropriateness of OOH calls. Factors that make calls “appropriate” include medical factors – e.g. the nature of patients’ symptoms and illness – but

				also non-medical factors – e.g. patients' compliance and politeness. Authors suggest that the use of non-medical factors, as well as medical factors, may contribute to patients' confusion about what is and is not appropriate. This may impact on education programmes to decrease inappropriate demand.
(O'Brien et al., 2005)	Ireland; GP OOH care. 115 GP spouses.	Questionnaire/survey.	To compare the effects of out-of-hours commitments on personal and family life between the spouses of GPs participating or not in a rural co-op	77/125 spouses replied (67% RR). 59 GPs were in co-ops; 66 were in traditional OOH on-call rotas. Most respondents agreed that OOH impacted on family life. Those whose spouses were not in co-ops more likely to agree that home life interrupted by patient calls; by patients coming to the door; and by worries about spouse safety.
(McLoughlin et al., 2005)	Ireland; GP OOH care. 120 GPs	Questionnaire/survey.	To test the study hypothesis that GPs participating in co-operatives will have more positive attitudes towards co-operatives, better mental health and less stress than GPs using traditional out-of-hours arrangements.	89/120 GPs responded (RR 74%). No difference in mean GHQ score, mean stress score or mean arousal score between GPs in OOH co-op and GPs not in co-op.
(Zeitz et al., 2006)	Australia; OOH care. Rural communities – 80 rural GPs, 200 rural nurses	Mixed methods	To report on the issues highlighted by clinicians in providing after-hours primary medical care in rural and remote communities.	Issues highlighted by clinicians included: community expectations; systems of care; scope of practice; private practice/public hospital interface; and medico-legal issues, including scope of practice of GPs and nurses.
(O'Dowd et al., 2006)	Ireland; OOH co-operatives. 221 GPs	Questionnaire/Survey	To investigate GP satisfaction, the working environment, governance and	82% of GPs responded and confirmed the co-operatives' positive effects on

			future developments in OOH co-operatives.	their lives. However, 57% still received requests for out-of-hours care while off duty, most commonly from patients who preferred to see their own doctor. Half felt overburdened by out-of-hours work, especially those aged over 40yr. Twenty-five per cent were dissatisfied with the GP complaints mechanism. The majority (63%) would prefer a GP/health board partnership for the organization of out of hours, while 23% wanted sole responsibility. GPs indicated a strong need for better ancillary services such as nursing, mental health, dentistry, pharmacy and social work. Access to records is an important issue in terminal care and mental illness.
(Zakariassen et al., 2008)	Norway; OOH general practice. 3804 GPs	Questionnaire/Survey	To study the participation of Norwegian regular general practitioners (RGPs) in the out-of-hours system in 2006 and what kind of emergency situations and procedures they experienced in the past 12 months.	2913/3804 (RR 78%). 1832 (63%) confirmed they had taken part in emergency OOH services in the past 12 months. The most common situations were chest pain, psychiatric problems and asthma, experienced by 94%, 92% and 88%, respectively. The number of occasions the doctors had experienced the most frequent emergency procedures (median 25–75% percentiles) were: intravenous medication, three (1–10); oxygen mask, three (1–10); venous access, four (1–10). The doctors reported almost no

				experiences with other procedures. The doctors reported a high self-confidence in performing the emergency procedures. Male doctors working four or more shifts per month and doctors working in rural areas reported more experiences both in emergency situations and procedures.
(Geue et al., 2009)	Scotland; General practice. 4605 GPs.	Questionnaire/Survey	To analyse which factors influence an individual GP's decision to re-provide OOH care when their practice has opted out.	2380/4605 GPs (RR 52%). Of these, 40.6% participated in OOH provision even though their practice had opted out. Participation rates of GPs within primary care organisations varied from 16.7% to 74.7%. Males with young children were substantially more likely to participate than males without children (odds ratio [OR] 2.44, 95% confidence interval [CI] = 1.36 to 4.40). GPs with higher-earning spouses were less likely to participate. This effect was reinforced if GPs had spouses who were also GPs (OR 0.52, 95% CI = 0.37 to 0.74). GPs with training responsibilities (OR 1.36, 95% CI = 1.09 to 1.71) and other medical posts (OR 1.38, 95% CI = 1.09 to 1.75) were more likely to re-provide OOH services.
(Johansen et al., 2011)	Norway; Casualty clinics. 45 GPs	Qualitative study	To explore which challenges GPs experience when providing emergency care out-of-hours to patients presenting problems related to mental illness or substance abuse.	Safety and uncertainty were the dominating themes in the discussions. The threat to personal safety due to unpredictable patient behaviour was a central concern, and present security

				precautions in the out-of-hours services were questioned. The GPs expressed high levels of uncertainty in their work with patients presenting problems related to mental illness or substance abuse. The complexity of the problems presented, shortage of time, limited access to reliable information and limited range of interventions available during out-of-hours contributed to this uncertainty. Perceived access to second opinion seemed to have a major impact on subjectively experienced work stress.
(Taubert and Nelson, 2011)	Wales; 9 GPs. OOH service	Qualitative study	To establish how prepared GPs who work regular out-of-hours shifts feel when dealing with end-of-life issues in palliative care patients, what they thought about seeing such patients and whether they considered themselves emotionally equipped to do so	GPs expressed unease when dealing with palliative care patients. Emotional “housekeeping” in terms of looking after oneself after emotionally charged consultations was an important process. GPs used reflective time, sharing with peers, compartmentalisation and personal empathy to deal with the stress.
(Joa and Morken, 2012)	Norway; OOH primary care. All staff at 20 OOH centres, 716 participants	Questionnaire/Survey	To investigate (1) the prevalence of occupational violence in out-of-hours (OOH) primary care, (2) the perceived cause of violence, and (3) the associations between occupation, gender, age, years of work, and occupational violence.	536/716 replied (RR 75%). Overall, 78% had been verbally abused, 44% had been exposed to threats, 13% physically abused, and 9% sexually harassed during the last 12 months. Significantly more nurses were associated with verbal abuse (OR 3.85, 95% confidence interval 2.17 – 6.67) after adjusting for gender, age, and years in OOH primary

				<p>care. Males had a higher risk for physical abuse (OR 2.36, CI 1.11 – 5.05) and higher age was associated with lower risk for sexual harassment (OR 0.28, CI 0.14 – 0.59), when adjusted for background variables. Drug influence and mental illness were the most frequently perceived causes for the last occurring episode of physical abuse, threats, and verbal abuse. Authors conclude that OOH employers must do more to prevent occupational violence in OOH care.</p>
(Drinkwater et al., 2013)	<p>England;          Unscheduled care.          Range of health care professionals inc          OOH GPs</p>	<p>Qualitative study</p>	<p>To explore healthcare professionals' understanding of why patients with long-term conditions use unscheduled care, and the healthcare professionals' understanding of their role in relation to reducing the use of unscheduled care.</p>	<p>29 interviews conducted. Healthcare professionals viewed the use of unscheduled care as a necessary component of care for patients with long-term conditions. Those whose roles involved working to targets to reduce the use of unscheduled care described a tension between this and delivering optimum patient care. Three approaches to reducing unscheduled care were described: optimising the system to direct patients to more appropriate services; negotiating the system; and optimising the patient, in particular trying to reduce patients' use of unscheduled care.          N.B. No differentiation between daytime and OOH unscheduled care, but it is OOH GPs that they interview.</p>

(Smits et al., 2014)	The Netherlands; OOH co-operatives. 688 GPs	Questionnaire/Survey	To examine positive and negative experiences of GPs providing out-of-hours primary care, and the frequency and reasons for outsourcing shifts.	688 replied (RR 55%). The main reasons for working in GP cooperatives were to retain registration as GP (79%) and maintain experience in acute care (74%). GPs considered the peak hours (81%) and the high number of patients (73%) as the most negative aspects. Most GPs chose to provide the out-of-hours shifts themselves: 85% outsourced maximally 25% of their shifts. The percentage of outsourced shifts increased with age. Main reasons for outsourcing were the desire to have more private time (76%); the high workload in daytime practice (71%); and less the workload during out-of-hours (46%). Authors conclude that in order to keep GPs in OOH care, necessary to set limits on their workload.
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**Table A7. Papers dealing with models of care**

Citation	Setting	Study Design	Aim	Key Findings
(Cragg et al., 1997)	England; GP practices and deputising services. 2152 patients; 49 practice doctors; 183 deputising doctors	RCT	To compare the process of out of hours care provided by general practitioners from patients' own practices and by commercial deputising services.	1046 calls dealt with by practice doctors; 1106 by deputising doctors. Practice GPs more likely to give telephone advice (20.2% vs 0.72% of calls) and to visit more quickly (median delay 35 min vs 52 min). Practice GPs less likely to issue prescription (56.1% vs 63.2%) of prescribe antibiotic (43.7% vs 61.3%). Practice GPs also more likely to prescribe generic drugs, cheaper drugs and drugs from OOH formulary. No significant different in hospital admissions.
(McKinley et al., 1997)	England; GP practices and deputising services. 2152 patients; 49 practice doctors; 183 deputising doctors	RCT	To compare the outcome of out of hours care given by general practitioners from patients' own practices and by commercial deputising services	Patients seen by deputising doctors were less satisfied with their care (mean overall satisfaction score 70.7 own GPs vs 61.8 deputising GPs). Greatest difference in satisfaction was with delay in visiting; no different in health or status of subsequent use of health services between the two groups.
(Salisbury, 1997b)	England; GP co-operative (3920 calls) and a deputising service (1892 calls)	Observational prospective case review	To evaluate an out of hours cooperative of general practitioners compared with a deputising service	Doctors from co-operative visited 32.0% of patients; offered telephone advice to 57.8%; saw 7.1% at primary care centre. Doctors in deputising service visited 76.3% of patients; gave telephone advice to 19.3%.

				Doctors from co-op prescribed drugs to fewer patients (37.6% vs 51.7%), but admitted slightly more to hospital (8/7% vs 6.8%). While response time were faster for deputising service in terms of seeing a doctor, time to first contact with a doctor was faster at co-op, due to telephone advice from a GP. Authors suggested that use of primary care centres needed to be monitored for acceptability to patients.
(South Wiltshire Out of Hours Project (SWOOP) Group, 1997)	OOH nurse-led telephone triage service, England	Mixed methods	To assess impact of nurse-led telephone triage service	Pilot service run for a combined practice population of 10,000 patients. 56 calls received from 54 callers; 21 calls (38%) handled only by the nurse. Of the 35 calls referred to GP, nurse provided interim advice for 22 (39%). Most referrals to GP were for children, as per practice policy. No triage decision was changed by the GP. There were no deaths, hospital admissions or ambulance calls relating to these calls. 44 callers received follow-up questionnaire. Majority (87%) were satisfied or highly satisfied with the care received. Of 19 who spoke only to the nurse, only 5 would have preferred speaking to the GP.
(Jessopp et al., 1997)	UK; GP co-operatives registered with National Association	Questionnaire/Survey	To investigate the extent of change and likely future direction of GP co-operatives	67/98 replied (RR 68%), representing 5476 GPs and 11,462,500 patients. 52 (78%) established during 1995-96; 19 (28%) operational for under 3 months.

	of GP Co-operatives. 98 co-operatives.			GP membership: mean 82; median 67. 61 (91%) had support from OOH Development Fund. All offered home visits; 98% offered telephone advice; 97% visits to a base/centre. Most employed non-medical managers, administrators and drivers, but only 28% employed nurses or nurse practitioners.
(Bain et al., 1997)	Scotland; GP co-operative. Patients and GPs.	Mixed methods	To describe the setting up of an out-of-hours cooperative in Dundee, and to illustrate the main findings during the first year of operation	In first year, received 24,746 calls (2064 pm). 34% of patients received home visit; 37% telephone advice; 23% seen at centre. 583/1,237 patients responded (47.1% RR). 89% contacted GP without too much delay; 57% preferred DDOCs to own GP; 71% rated service better or comparable to previous services used. DDOC members liked having OOH duties contained within a defined period of time and were supportive of being driven to house visits by a security guard.
(Christensen and Olesen, 1998)	Denmark; OOH co-operatives	Routine data analysis	To evaluate impact of OOH reforms in Denmark 5 years after implementation	OOH reforms resulted in OOH service organised at county level, with telephone access to a GP in OOH period. Telephone consultations had almost doubled in the 5-year period, to 48% of all calls. Consultations in GP surgeries slightly increased from 24% to 33%; home visit decreased from 46% to 18%. GP OOH workload decreased markedly,

				with percentage doing no OOH work increasing from 23% to 36%. Patient satisfaction had decreased over the 5-year period from 68% to 56%. Patients who did not get the service they expected (in particular home visit) more likely to be dissatisfied.
(Hansen and Munck, 1998)	Denmark; OOH co-operative	Questionnaire/survey	To describe patient satisfaction and use before and after introduction of GP OOH co-operative.	Total number of patient contacts reduced by 16% in first year, but only by 6% three years later. Three years after introduction of co-operative, telephone consultations had more than doubled from 22% to 54%; home visits decreased from 57% to 19%. Surgery consultations fairly steady (21% to 27%). Although patient satisfaction fairly high at 55/7%, this was a decrease from 68.2% prior to introduction of co-op. Annual expenditure by the county on GP fees fell by DKK9.3 million (20% reduction), attributed to changes in contact patterns.
(Dale et al., 1998)	England; OOH triage and advice service in general practice. 10,188 calls.	Routine data analysis	To evaluate an out-of-hours telephone triage and advice service in general practice.	A telephone assessment and advice service provided by nurses working in an OOH service. All nurses recruited had community nursing and/or general practice nursing experience and were trained in telephone triage. 25 nurses took a mean of 407 calls (range 123-918). Mean length of call was 6.73 minutes. Calls used 111 of the

				assessment pathways; 30 pathways accounted for 90.6% of assessed symptoms. 5009 (49.2%) of callers were advised to see a doctor face-to-face, either at centre, in A&E or by home visit. Remaining 50.8% given nurse advice, including self-care or to consult own GP in daytime hours. There was variation in call outcomes across the triaging nurses, although no explanatory variables to try to understand this. Service was acceptable to patients with only 4 complaints received (8 for GP care in same time period).
(Lattimer et al., 1998)	England; GP OOH co-operative 14492 contacts for 10134 patients	RCT	To determine the safety and effectiveness of nurse telephone consultation in out of hours primary care by investigating adverse events and the management of calls.	Intervention: Management of calls by trained triage nurses vs GPs taking the calls. Of the 14492 contacts, 7308 in the control arm and 7184 in the intervention arm. No substantial differences in the age and sex between the groups; male patients underrepresented overall. Reasons for calling the service were consistent with previous studies (though not stated). Nurses managed 49.8% of calls during intervention periods without referral to a GP. During intervention periods: 69% reduction in telephone advice from a GP; 38% reduction in patient attendance at primary care centres; 23% reduction in home visits. No

				<p>difference in number of deaths within seven days, in the number of emergency hospital admissions, and in the number of attendances at A&amp;E. Concluded that nurse triage safe and effective.</p>
(O'Donnell et al., 1999a)	Multiple; OOH care	Literature review	To examines the current literature evaluating changes to out of hours care	<p>Review identified gaps in knowledge. A number of papers examining GP co-operatives and centres were identified, but little or no work on other forms of OOH care. Little known about role of single-handed GPs in providing OH care or about OOH care in small towns and rural areas.</p>
(Lattimer et al., 2000)	England; OOH GP co-operative. 55 GPs; 97,000 registered patients	Cost analysis	To undertake an economic evaluation of nurse telephone consultation using decision support software in comparison with usual general practice care provided by a general practice cooperative.	<p>Cost of providing nurse telephone consultation was £81,237 per annum. This determined a £94,422 reduction of other costs for the NHS due to reduced emergency admissions to hospital. Using point estimates for savings, the cost analysis, combined with the analysis of outcomes, showed a dominance situation for the intervention over GP co-operative care alone. Using upper and lower CI limits, NHS savings range from £3,728 to £123,824 pa. To break even, the intervention would have needed to save 138 emergency hospital admissions per year, around 90% of the effect achieved in the trial. Additional savings of £16,928 for general practice arose</p>

				<p>from reduced travel to visit patients at home and fewer surgery appointments within three days of a call.</p> <p>Authors conclude that nurse telephone consultations can lead to reduced admissions, with resultant reduction in NHS costs.</p>
(Munro et al., 2000)	England; NHS Direct. Three NHSD sites; 6 GP co-operatives as controls.	Observational prospective case review	To assess the effect of NHS Direct on overall demand for NHS immediate care services in its first year of operation.	<p>NHS D received 68,500 calls from a population of 1.3 million in its first year. 72% of calls were OOH; 22% about a child under 5.</p> <p>Small, non-significant impact on trends in use of either A&amp;E or ambulance service.</p> <p>Changes in trends of use of OOH GP co-ops also small, but significant: from increase of 2.0% a month before NHS D to -0.8% decrease afterwards.</p> <p>Reduction in trend sig for both telephone advice alone and those leading to contact with a GP. No changes in trend in control co-ops.</p> <p>Authors conclude NHS D did not reduce use on NHS immediate care service, but may have restrained increasing demand for GP OOH services.</p>
(Vedsted and Christensen, 2001)	Denmark; OOH GP and casualty ward attendance	Routine data analysis	To analyse the effect of the out-of-hours reform on the number of contacts with the casualty wards.	Examined contacts with casualty wards in county of Aarhus from 1988 to 1997, thus covering the time when GP OOH care changed. Mean number of contacts with casualty wards rose significantly over the 10-year period. Regression

				analysis showed that the increase after the reforms was statistically insignificant. In conclusion, decrease in total number of contacts with OOH GP care did not lead to corresponding increase in casualty ward use.
(Barnsley et al., 2002)	Canada; walk-in clinics. 803 primary care practices, inc walk-in and urgent care clinics; mixed practices; after-hours clinics; group family practices	Questionnaire/Survey	To compare walk-in clinics with other primary care settings on characteristics associated with best practices in primary care	Walk-in clinics, after-hours clinics and mixed practices were more likely to be open during evenings and weekends and more likely to see patients without appointments. Group family practices were more likely to have on-call arrangements and had greater continuity of care. Walk-in clinics were less likely to provide preventive care and psychological counselling. N.B. This illustrates the mixed economy of North American health care coverage; walk-in clinics not operating in the same kind of health care system as those in the UK.
(Salisbury and Munro, 2003)	Multiple; walk-in centres	Systematic review	To review international experience with walk-in centres in primary and emergency care and identify relevant lessons for the UK.	International literature indicates that users of walk-in centres in other countries tend to be relatively affluent, of working age and different to the population using general practice services. WICs used when other health services are closed, mainly for minor illnesses and injuries. People choose WICs for reasons of convenience and satisfaction is generally high. However,

				<p>insufficient evidence about the impact of WICs on other health care services or the costs of such care.</p> <p>Authors conclude that there is currently limited evidence to inform the development of WICs in England.</p> <p>N.B. Authors point out that WICs have existed in US, Canada, Australia and South Africa but that the model differs from that in England, e.g. those centres tend to be doctor-led rather than nurse led and they exist in a different health care economy. These WICs also provide care primarily in the OOH period, unlike those in England.</p>
(Thomson et al., 2003)	Multiple; OOH general practice services. 15 sites representing 10 models of care; 65 interviews with key informants	Mixed methods	To describe variations in the different models of out of hours general medical services and identify explanations for variation and the possible influence on patient satisfaction and service costs.	<p>Considerable structural heterogeneity, even within co-ops. Reasons include population served, geography, resources available and political expediency. Little evidence of integration with other services; use of guidelines or protocols; staff training. Centralised call triage was used variably; only one large urban co-op provided patient transport service. Neither patient satisfaction nor costs varied by model of service provision. Centralised call handling and triage unlikely to work for remote and rural services.</p> <p><b>N.B.</b> This work pre-dated NHS 24.</p>
(Hsu et al., 2003)	England; NHS walk-in centre. Data from	Before and after observational study	To assess the effect of an NHS walk-in centre on local primary and emergency	No significant difference between the town with a WIC and the control area

	before and after WIC opened, compared to area with no WIC		healthcare services.	(with no WIC) for: daily rate of emergency GP appointments, time to bookable routine appointments, and daily rate of attendances at OOH services. Attendances at minor injuries unit sig higher in ton with WIC; non-ambulance A&E attendance fell less in WIC town. NHS WIC did not impact greatly in workload of GPs, either in-hours or OOH. Workload at minor injurie unit increased significantly, probably due to its co-location with the WIC. <b>N.B. This work examined GP activity both in-hours and OOHs.</b>
(Chalder et al., 2003)	England; Walk-in centres. Towns with WICs; matched control towns without WIC. 20 A&E depts; 40 general practices; 14 OOH centres, all within 3km of WIC	Time series analysis	To assess the impact of NHS walk-in centres on the workload of local accident and emergency departments, general practices, and out of hours services.	Non-significant reduction in consultations at A&E and general practices close to WICs. No impact on consultations at OOH services.
(Leibowitz et al., 2003)	Multiple; After hours primary care services. Included reviews and comparative study designs (19 papers).	Systematic review	To determine what evidence exists about the effect of different models of out-of-hours primary medical care service on outcome, workload, patient & GP satisfaction	Six main models of after-hours primary care services (not mutually exclusive): practice-based services, deputizing services, emergency departments, co-operatives, primary care centres, and telephone triage and advice services. Telephone triage and advice service for after-hours primary medical care may

				<p>reduce the immediate medical workload. Deputizing services increase immediate medical workload due to low use of telephone advice and the high home visiting rate. Co-operatives, which use telephone triage and primary care centres and have a low home visiting rate, reduce immediate medical workload.</p> <p>Little evidence on the effect of different service models on subsequent medical workload, except that GPs working in emergency departments may reduce the subsequent medical workload.</p> <p>Little evidence about the advantages of one service model compared with another in relation to clinical outcome. Studies consistently showed patient dissatisfaction with telephone consultations.</p>
(Mark and Shepherd, 2004)	<p>England; NHS Direct. Three study periods with 5,522, 10,014 &amp; 9,866 patient records. 25 interviews with GPs, nurses, all handlers and other staff.</p>	Mixed methods	<p>To explore the impact of NHS Direct on demand for primary care in particular out-of-hours services from GPs.</p>	<p>No significant increase in total call volume; centre visits, refer to GP and nurse advice all declined over time when NHS D introduced. Doctor advice increased; home visits first increased then decreased. Ambulance and A&amp;E referrals remained stable. Some changes observed in dealing with some patient groups, in particular the elderly and children, e.g. home visits increased for older patients.</p> <p>Nurses reported that they felt their role</p>

				<p>shifted from that of gatekeeper when employed by GP OOH co-op to that of patient advocate when employed by NHS D.</p> <p>Authors conclude that organisational and behavioural changes are important in changing the demand for OOH care.</p>
(Pickin et al., 2004)	England; GP OOH co-operative. 26,911 users (13,442 before; 13,469 after). Structured interviews with 653 patients; survey of 98 GP practices	Mixed methods	To assess the impact of establishing a general practice co-operative on use of A&E services, patient satisfaction and GP satisfaction.	No change in use of A&E (OR 1.08) nor in patient satisfaction. GPs in member practices much more satisfied with OOH duty of GPs in non-member practices (67% vs 10%).
(Christensen et al., 2004)	Denmark; GP OOH service. 4500 patients in intervention arm; 4635 patients in control	Cluster RCT	To investigate whether the number of frequent attenders (FA) contacts with the out-of-hours service can be reduced by deploying a combination of intervention strategies.	Intervention patients had more pronounced decrease in number of contacts with service, compared with controls, but only at 12 months.
(van Uden and Crebolder, 2004)	Netherlands; OOH primary care.	Retrospective record review, before and after introduction of 3 GP OOH co-ops	To investigate whether the reorganisation of out of hours primary care, from practice rotas to GP cooperatives, changed utilisation of primary and hospital emergency care.	10% increase in patient contacts with OOH primary care; 9% decrease in contacts with OOH emergency care. Self referrals to A&E decreased by about 4%. Authors conclude that re-organisation of OOH primary care shifted contacts from emergency care to primary care.
(Bury et al., 2005)	Ireland; GP co-operatives. 11 co-operatives; interviews with GPs	Mixed methods	To describe the role of co-operatives in the management of emergencies, both in quantitative and qualitative terms.	Incidence of emergencies varied, from almost 0 to 10% of contacts. Services tended to rely on the skills of triage staff rather than use of protocols to identify

	and management in 5			emergencies. Eight of 11 co-operatives provided a domiciliary service with some responding to calls from ambulance services and Gardai (police) for medical assistance. Very limited liaison structures with ambulance services at any level. Interviews with staff revealed concerns, with a perceived role as a service dealing with 999 type calls rather than with emergencies encountered in the course of normal general practice work.
(Lattimer et al., 2005)	England; Integrated OOH exemplar sites. 34 GP co-ops integrated with NHS D; 10 control co-ops	Observational before and after study	To quantify service integration achieved in the national exemplar programme for single call access to out of hours care through NHS Direct, and its effect on the wider health system.	Of 31 distinct exemplars, 21 (68%) integrated all OOH call management. Nine (29%) had single call access for all patients. Before and after comparison of one found that a higher proportion of telephone calls were handled by co-operative nurses before integration than by NHS Direct afterwards (39% vs 30%). A small but significant downturn in overall demand for care seen in two case exemplars was also seen in the control cooperatives. The number of emergency ambulance transports increased in three of the four case exemplars after integration, reaching statistical significance in two. This was always accompanied by a significant reduction in the number of calls to the integrated service.

				<p>Authors concluded that most exemplars achieved integration of call management but not single call access for patients. Most patients made at least two telephone calls to contact NHS Direct, and then waited for a nurse to call back. While demand may be transferred from ambulance services to Exemplar sites, they suggested that NHS Direct might not have sufficient capacity to support national implementation of the programme.</p>
(van Uden et al., 2005b)	The Netherlands; OOH co-operatives. 203 GPs.	Questionnaire/Survey	To gain insight into GPs' satisfaction with working at GP cooperatives for out-of-hours care in separated and integrated cooperatives.	<p>100 GPs (50 in a co-op separate from the hospital A&amp;E and 50 in a co-op integrated with an A&amp;E dept). GPs from the separated model were more satisfied with the organisation of out-of-hours care than GPs from the integrated model (70 vs. 60 on a scale score from 0 to 100; <math>P = 0.020</math>). Satisfaction about out-of-hours care organisation was related to opinions on workload, guarantee of gatekeeper function, and attitude towards out-of-hours care as being an essential part of general practice. Authors did not have explanation for this finding, but suggested it might be partly due to the integrated model being relatively new and still "bedding in"; also is was housed in less optimal surroundings. Cooperation with medical specialists</p>

				was much more appreciated at the integrated model (77 vs. 48; $P < 0.001$ ) versus the separated model.
(Crossland and Veitch, 2005)	Australia; After hours primary medical care. 120 organisations	Mixed methods	To describe the key features of after-hours primary medical care service sustainability and development of a framework for future service development	Five factors related to sustainability were identified in the after-hours services: dedicated business management and promotion, rather than relying on the “pooled talent” of individual GPs; formalised collaborative service arrangements with other service providers and stakeholders; effective protocols and guidelines; recruitment and retention strategies to maintain OOH workforce; remuneration. These factors interact and contribute to on-going sustainability.
(Munro et al., 2005)	England; NHS Direct. Total patient contacts >60 million	Routine data analysis	We analysed the impact of NHS Direct on demand, taking advantage of the fact that the service was introduced in waves over a period of 2 years.	Introduction of NHS D associated with a reduction in calls to GP OOH co-ops of almost 8% per year, but had no impact on emergency services.
(Van Uden et al., 2005d)	Netherlands; GP OOH co-operative.	Retrospective case review before and after introduction of co-operative	To determine the effect of an out-of-hours primary care physician (PCP) cooperative on the caseload at the emergency department (ED) and to study characteristics of patients utilizing out-of-hours care.	The percentage of patients using emergency care fell by 53% after introduction of co-op; percentage of patients using the OOH primary care service increased by 25%. Shift greatest for patients with MS problems or skin problems. Fewer hospital admissions and fewer referrals to daytime GP or hospital specialists. No impact on mortality.
(Hurst, 2006)	Multiple; OOH	Literature review	To examine issues pertaining to OOH	Identified several themes: nature and

	primary and community care. Almost 140 papers, most set in the UK		care after the new General Medical Service contract was implemented in 2004.	value of services (essentially a description of services); OOH activity; efficiency and effectiveness of services; staff numbers and skill mix; education and training; information management and technology.
(Bury et al., 2006b)	Ireland; 3 Health Boards. 511 GPs (511) and 301 Emergency Medical Technicians (EMTs)	Questionnaire/Survey	To explore the perceptions of GPs and EMTs of their own and each other's roles in the context of such reforms.	72% of GPs and 75% of EMTs responded. They reported excellent working relationships, agreed that the ambulance service is of high quality, and that GPs are willing to provide care in emergencies. However, working links were less satisfactory for EMTs, who reported a far higher perception of GP use of emergency ambulances than reported by GPs. Both groups were interested in innovative future links, for example with inter referrals, common protocols and mutual support. Authors conclude that there is scope for improved liaison between the two professional groups.
(van Uden et al., 2006)	Multiple; OOH primary care.	Literature review	To develop an overview of the effect of out-of-hours care reorganization, with particular reference to The Netherlands	Identified a range of studies which showed that OOH reorganisation could address many of the issues facing Dutch OOH care. GPs' job satisfaction increased; patients appeared to be satisfied with the care received. Range of questions remain unanswered, including how to organise services to optimise effects and costs; impact of nurse telephone triage; single point of

				access; impact of integrating GP OH co-ops with emergency departments.
(Haddow et al., 2007)	Scotland; NHS 24. 26 interviews with OOH GPs, A&E, ambulance, NHS 24 senior staff & policy makers	Qualitative study	To explore stakeholder perspectives of the implementation of a new, national integrated nurse-led telephone advice and consultation service (NHS 24), comparing the views of stakeholders from different health care organisations.	Implementation was rapid, with little time for reflection. Key areas of partner concern were increasing workload, the clinical safety of nurse triage and the lack of communication across the organizations. Concerns were most apparent within the GP OOH co-operative, leading to calls for the dissolution of the partnership. A&E and ambulance service responses were more conciliatory, suggesting that such problems were to be expected within the developmental phase of a new organization. Further exploration of these responses highlighted the sense of ownership within the GP co-op, with GPs having both financial and philosophical ownership of the co-op. This was not apparent within the other two partner organizations, in particular the ambulance service, which operated a regional model very similar to that of NHS 24. Authors conclude that as the delivery of unscheduled primary health care crosses professional boundaries and locations, different organizations and professional groups must develop new ways of partnership working, developing trust and confidence in each

				other.
(Dunt et al., 2007)	Australia; Emergency GP after hours service.	Interrupted time series	To determine in four of the five trials where telephone triage was the sole innovation, if there was a reduction in emergency GP after hours service utilization (GP first call-out) as measured in Medicare Benefits Schedule claim data.	Significant reduction in first call-out claims in 3 of the 4 areas with stand-alone call centre services. Two services had call triage embedded in existing services: one saw significant reductions in first call-out claims, but the other didn't. Authors conclude that, while telephone triage associated with reduction in first call-out claims, may be due to other factors which they couldn't identify.
(Halter et al., 2007)	GP OOH Service, London, England	Telephone questionnaire	To evaluate patient satisfaction associated with Emergency Care Practitioner home visits	174 eligible, 63 excluded. 111 contacted after home visit, 81 (73%) completed survey. 59/60 (98.3%) not admitted to hospital felt care received was right and/or followed treatment advice. 86% of 81 felt clear about the ECP assessment, 58% felt health was better after home visit. 39% of those referred on after home visit were not seen and 38% of those not referred on were seen by another health care professional – suggesting unclear instructions/management. Note no comparison with GPs and small sample size.
(O'Keefe, 2008)	Ireland; GP OOH co-operative. 2,021 patient contacts	Retrospective case review; before and after co-op opened	To assess the impact of the impact of a new OOH co-op on attendance at a local A&E department	Reviewed 1,015 attenders before the co-op opened; 1,006 after the co-op opened (winter in both data collection periods). No statistically significant differences between the two groups in

				terms of: unnecessary attenders (assessed using a “process of care tool”); attenders discharged after a normal X-ray; admissions; transfers to other hospitals; or non-surgical paediatric attenders.
(Ingram et al., 2009)	England; GP OOH co-ops. 234 OOH GPs; 73,453 patient contacts	Mixed methods	To compare rates of referral to hospital for doctors working OOH before and after the new general medical services contract; to explore the attitudes of GPs to referral to hospital OOH; and to develop an understanding of the factors that influence GPs when they refer patients to hospital.	No change in referral rates after the contract changes, nor in the fourfold variation between highest and lowest referrers. Female GPs made fewer home visits and had a higher referral rate for patients seen at home. Logistic regression showed that GPs with low “tolerance of risk” scores significantly more likely to be higher referrers to hospital. Authors conclude that GPs’ threshold of risk an important determinant in explaining variation in OOH referrals to hospital.
(Roberts et al., 2009)	Scotland; NHS 24. 35 interviews; key stakeholders in NHS 24 and partners in NHS Boards.	Qualitative study	To assess whether a model of centralised nurse telephone triage (NHS 24) was appropriate for remote and rural areas.	Rigidity of the centralised triage model, the importance of understanding variation in health service delivery across remote and rural areas, and the importance of utilising local professional knowledge were all key issues affecting performance. Authors conclude that new health services need to be “proofed” for the challenges of delivering care in remote and rural settings.
(Huibers et al., 2009)	Multiple; OOH care.	Questionnaire/Survey	To assess prevailing models of out-of-	Most countries have several different

	71 key informants from 25 countries		hours in order to identify their potential strengths and weaknesses.	OOH models co-existing. A&E department was most frequently used organisational model. Perceived weaknesses of this model concerned Co-ordination and continuity of care, its efficiency and accessibility. In about a third of countries, the rota group was the most dominant organizational model. A perceived weakness of this model was lowered job satisfaction of physicians. The GP co-op existed in a majority of the participating countries; no weaknesses were mentioned with respect to this model. GP co-ops were seen to combine size of scale advantages with organizational features of strong primary care, such as high accessibility, continuity and coordination of care. Most countries had plans to change their out-of-hours care, mainly toward large scale organizations.
(Weinick et al., 2009)	US; Urgent care centres	Questionnaire/Survey	To provide information about the organization and functioning of urgent care centres based on a nationally representative U.S. sample.	Urgent care centres are open beyond typical office hours, and their scope of services is broader than that of many primary care offices. While these characteristics are similar to hospital emergency departments, such centers employ significant numbers of family physicians. The payer distribution is similar to that of primary care, and physicians' average salaries are

				comparable to those for family physicians overall. Urgent care centers appear to be early adopters of electronic health records.
(O'Kelly et al., 2010)	Ireland; GP OOH co-operative.	Routine data analysis, 1999-2007	To determine whether ED attendances for patients in the lower acuity triage categories 4 and 5 have changed since the establishment of an OOH HO co-operative	ED attendances during co-operative hours decreased as a proportion of all attendances for triage categories 4 and 5.
(Thompson et al., 2010)	England; OOH primary care.	Routine data analysis, 1999-2006	To quantify the change in patient type presenting to our emergency department.	Steady increase in ED attendances over the time period; number and proportion of patients with non-traumatic conditions rose steadily. Number of patients presenting with traumatic conditions stayed the same. Number of patients presenting with non-traumatic conditions OOH rose after 2004 changes in OOH primary care.
(O'Keefe et al., 2011)	UK; Emergency and urgent care services (minor injury unit; urgent care centre; GP OOH service)	Quasi-experimental community intervention trial	To evaluate the impact of emergency care practitioners (ECPs) on the patient care pathway for children presenting with minor conditions in unscheduled care settings.	ECPs discharged significantly fewer patients than usual care providers (% difference 7.3%, 95% CI 13.6% to 0.9%). ECPs discharged fewer patients within all three pairs of services (out of hours % difference 6.33%, 95% CI 15.17% to 2.51%; UCC % difference 8.73%, 95% CI 19.22% to 1.76%; MIU % difference 6.80%, 95% CI 24.36% to 10.75%). ECPs also referred more patients to hospital (% difference 4.6%, 95% CI -2.9% to 12.0%) and primary care providers (% difference 3.0%, 95% CI 3.7% to 9.7%). Authors conclude that ECPS not as

				effective as usual care providers in discharging children after assessment of urgent health care problems.
(Godden et al., 2011)	Scotland; OOH services.	Questionnaire/Survey	To identify and assess the availability and adequacy of relevant standards, responsibilities and information systems in Scotland to monitor the impact of contractual changes to out-of-hours healthcare services on equity of access	Data monitoring systems have not kept pace with changes in the organisation of OOH care, so impact on access to services for different population groups is unknown. Significant gaps in information collected with respect to workforce, distribution of services, service utilisation and clinical outcomes.
(Farmer et al., 2011)	Scotland; Physician assistants. Range of professionals inc 15 US-trained physician assistants, supervisors, patients and senior managers	Mixed methods	To evaluate the impact and contribution made by PAs to delivering effective health care in National Health Service (NHS) Scotland.	PAs worked in a range of settings inc in-hours primary care (n=5), OOH (n=3), emergency medicine (n=4), intermediate care (n=2), orthopaedics (n=1). Scope of practice was different to that in the US; inability to prescribe was a hindrance. PAs tended to have longer consultations and were roughly equivalent to nurse practitioners or generalist doctors. Authors conclude there was potential for PAs to fulfil distinctive mid-level roles in the Scottish NHS.
(Giesen et al., 2011)	Netherlands; After-hours primary care co-operatives.	Narrative review	To identify issues about after-hours primary care in the Netherlands, including experiences of health care professionals and patients, patient-safety incidents, adherence to practice guidelines, waiting times, and quality of telephone triage	Physicians expressed high satisfaction with PCP cooperatives; workload decreased, and job satisfaction increased. Patients were also satisfied, but areas for improvement included telephone consultations, patient education, and distance to a pharmacy. One study identified patient-safety

				<p>incidents in 2.4% of all contacts, most did not result in harm to patients. Average waiting time for home visits was 30 minutes.</p> <p>Telephone triage by nurses had positive effects on care efficiency by increasing the proportion of telephone consultations, decreasing the proportion of clinic consultations and home visits. Future developments include integration and extensive collaboration with A&amp;E departments, in which PCPs take care of self-referring patients.</p>
(Fry, 2011)	Multiple; After-hours primary care models. 87 studies included	Systematic review	To examine (i) the impact of afterhours primary care models on ED, ambulance services and or general practitioners and (ii) the effectiveness of these services (afterhours) on nurse practitioners and/or the medical doctors delivery of care.	<p>Papers found from 9 countries; only 5 RCTs. Evidence largely based on quasi experimental (time series), before and after or comparative studies. Studies usually set in a single hospital or community setting with heterogeneous samples, short study timeframes and focussed on a single outcome e.g. patient satisfaction.</p> <p>Six models identified which can reduce GP workload, and to a lesser extent ED and ambulance services (MIUs, WICs, telephone triage and advice centres, GP co-operatives, ambulance officer managed care, GPs integrated into ED teams.</p>
(Plummer and Allan, 2011)	US; OOH palliative care telephone	Mixed methods	To evaluate use of a palliative care telephone advice line, from 2008-2010	13% increase in calls, from 1818 in 2008 to 2052 in 2010. Main reason for calls

	advice line.			was for symptom management, with 79% of calls made by patients' relatives. 66% of callers were very satisfied with the call and 67% of patients were not admitted to hospital.
(O'Hara et al., 2012)	England; Three different emergency care settings: static centres (ED, walk-in-centre, minor injury unit); ambulance/care home services (mobile); primary care out of hours services. 480 notes (240 from ECP services and 240 from non-ECP services	Retrospective case note review in matched sites with and without ECPs	To evaluate the impact of emergency care practitioners (ECPs) on the patient care pathway for children presenting with minor conditions in unscheduled care settings.	Care provided by ECPs was rated significantly higher than that of non-ECPs across some aspects of care, in particular overall care, assessment of the clinical problem and quality of records. However differences detected, although statistically significant, were small and may not reflect clinical significance. On other aspects of care, ECPs were rated as equal to their non-ECP counterparts. For the static centre based settings, the mean scores for ECPs were significantly higher than controls on four of the five rating categories: assessment; management; overall care, and quality of records ( $p < 0.01$ ). For the mobile services, there were no significant differences observed between the scores for the ECPs and controls. For the out of hours service the mean scores for ECPs were significantly higher than controls on only one of the five categories assessed ( $p < 0.01$ ). Authors conclude that care provided by ECPs met the minimum standards required.
(O'Malley et al., 2012)	US; Primary care	Qualitative study	To identify and describe models of	Five broad models of after-hours care

	practices & associated OOH organisations. 44 primary care physicians, practice managers, nurses and health plan representatives.		after-hours care in the U.S. that are delivered in primary care sites or coordinated with a patient's usual primary care provider.	were identified, ranging in the extent to which they provide continuity and patient access. Key themes included: 1) The feasibility of a model varies for many reasons, including patient preferences and needs, the local health care market supply, and financial compensation; 2) A shared electronic health record and systematic notification procedures were extremely helpful in maintaining information continuity between providers; and 3) after-hours care is best implemented as part of a larger practice approach to access and continuity. Authors concluded after-hours care coordinated with a patient's usual primary care provider is facilitated by consideration of patient demand, provider capacity, a shared electronic health record, systematic notification procedures and a broader practice approach to improving primary care access and continuity. Payer support important to increasing patients' access to after-hours care.
(Ismail et al., 2013)	Multiple; Primary care services dealing with urgent/unscheduled care	Systematic review	To review the evidence on primary care service interventions to reduce inappropriate A&E attendances.	9916 papers identified; 34 included. Telephone triage was the best evaluated intervention. This had a negligible impact on A&E attendance; patient satisfaction and clinical safety was acceptable; cost effectiveness was

				<p>uncertain.</p> <p>Limited evidence on ECPs suggest that ECPS in community settings may reduce A&amp;E attendance.</p> <p>Other interventions (WICs, MIUs, OOH general practice) showed inconclusive impact on A&amp;E attendance, patient outcomes and cost.</p>
(Redmond et al., 2013)	Ireland; GP-led Minor Injury Service with OOH radiology. 93 serial presentations	Mixed methods	To evaluate a recently established general practitioner (GP) led minor injury (MI) service	49 (81.6%) patients surveyed were seen in 30 min or less. 75% found the service excellent/very good; however 45% found the service expensive. Most patients were self-financing. In most cases, there was concordance between GP and radiologist.
(Turner et al., 2013)	England; NHS 111 service. 4 pilot sites; 3 control sites; population of 3.6 million	Controlled before and after study	To measure the impact of the urgent care telephone service NHS 111 on the emergency and urgent care system.	NHS 111 triaged 277 163 calls in the first year of operation for a population of 1.8 million. No change overall in emergency ambulance calls, emergency department attendances or urgent care use. There was a 19.3% reduction in calls to NHS Direct (95% CI -24.6% to -14.0%) and a 2.9% increase in emergency ambulance incidents (95% CI 1.0% to 4.8%). There was an increase in activity overall in the emergency and urgent care system in each site ranging 4.7–12%/month and this remained when assuming that NHS 111 will eventually take all NHS Direct and GP out of hours calls. Authors conclude that the NHS 111 did

				not deliver the expected system benefits of reducing calls to the 999 ambulance service or shifting patients to urgent rather than emergency care. There is potential that this type of service will increase overall demand for urgent care.
(Tan and Mays, 2014)	England; Primary and urgent care.	Systematic review	To examine the impact of ten initiatives in the primary & urgent care system on demand, equity, patient satisfaction, referrals, and costs	19 studies of 10 initiatives included. Innovations often overlapped, complicating care. Some demand for new service provision on grounds of convenience (e.g. WICs), but little evidence of substitution between services. Patient satisfaction varied. Little evidence on the cost and benefits of new vs existing provision.
(Rinehart et al., 2014)	Australia; 6 primary care organisations. 46 health care professionals (inc doctors and nurses) and admin staff	Mixed methods	To explore how GP clinics approached disseminating after hours information to patients	Medicare Locals responsible for co-ordinating after hours (AH) services in their catchments and supporting health systems and patients in accessing care appropriate to their needs. The 46 participating clinic staff had a strong focus on hospitals and locum services as the main AH options despite telephone advice line options being available. Additionally, there was a lack of awareness for some clinic staff concerning services for mental health, dental health and residential aged care. The educational forum and AH resources developed (brochures, posters. service directory) were rated as

				valuable for use with health care providers and patients. Confidence increased that patients would be able to find appropriate care in the AH period after clinics had finished implementing planned changes.
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**Table A8. Papers dealing with patient/carer views**

<b>Citation</b>	<b>Setting</b>	<b>Study Design and Size</b>	<b>Aim</b>	<b>Key Findings</b>
(McKinley et al., 1997)	Practice-based OOH care and deputising service, England	RCT	To compare the outcome of OOH given by GPs from patients' own practice and by commercial deputising service.	2152 patients requesting OOH care. Patients seen by deputising service were less satisfied with care. Mean overall satisfaction score was 70.7 (95% CI: 68.1 to 73.2) for own practice GPs; 61.8 (59.9 to 63.7) for deputising service. Greatest difference was for delay in visiting. No difference in change to health or overall health status 2 to 120 hours after the call.
(Salisbury, 1997c)	Practice-based OOH care and deputising service, England	Questionnaire survey	To compare patients' satisfaction with OOH care by a GP co-operative compared with that given by a commercial deputising service.	RR 67.0% (1555/2312). Little difference in overall satisfaction between patients contacting co-op those contacting deputising service. Patients contacting deputising service less satisfied with explanation and advice given and with wait for a visit. White patients and patients aged over 60 were more satisfied. Those receiving telephone advice, not getting a home visit, of who waited longer were less satisfied.
(Hansen and Munck, 1998)	GP OOH services, Denmark	Questionnaire and routine data analysis	To describe changes in patient satisfaction over the course of the introduction of a new OOH service.	Questionnaires posted 6 months before, 6 months after and 3 yrs after change to random sample. Response rate was 480/631 (76%), 322/460 (74%),

				and 1256/1631 (77%) respectively. Less OOH contact overall after change, less home visits, more telephone consultations. Lower levels of satisfaction after change however high levels throughout. No non-responder analysis.
(Plauth and Pearson, 1998)	Urgent care centre, USA	Questionnaire and routine data analysis	To investigate the characteristics and perceived barriers to primary care of those attending urgent care centres.	1996, 1 week - 551 seen at centre, 1000 at routine GP. Younger patients and less white patients seen in urgent care compared to routine GP care. Discharge diagnoses similar between settings. 38% of those seen at centre seen during normal hours. 421/551 (76%) completed questionnaire. Urgent care patients reported a need to be seen immediately, difficulty getting a routine appointment due opening hours or logistical problems and a positive attitude towards primary care. Most would have preferred to see usual physician but did not mind when they had an acute illness.
(Shaw and Milewa, 1998)	General public and GP practice patients, England	Focus group discussions	To explore opinions and utilisation behaviour of out of hours services.	5 focus groups (8-12 participants each). Themes identified: defining out of hours services, factors influencing which service is used, factors which influence patients' evaluations of services. Authors suggest definition of OOH depended on personal circumstances. Reasons for using were perceived urgency and reassurance. Factors

				associated with decision seemed to be transport, proximity, waiting times. Positive evaluation factors – local/personalised knowledge of area and patients – authors felt this emphasised the doctor-patient relationship.
(Shipman and Dale, 1999)	OOH care, UK	Mixed methods, including 98 patient interviews. 25 practices in total: 15 (61 GPs) in first period; 17 (66 GPs) in second period.	To assess patient views of the service and compare with GP views	Of the 98 patients, 51 given telephone advice, 43 visited at home, 4 attended surgery. There were discrepancies between patients' view of urgency and the GPs, particularly for emotional/psychological problems and for social help. Patients reported often looking for advice, explanation and reassurance about what to do about a problem. Particular areas of concern were in relation to fever, fear of meningitis, and pain. Authors conclude that consensus required over what OOH primary care should deal with – urgent vs emergency – and be more accommodating in defining 'appropriate' use. Also need more multidisciplinary working.
(Free et al., 1999)	OOH care, London, England. 51 participants	Qualitative study	To describe experiences and perceptions of members of the Vietnamese community in seeking OOH care and to identify potential solutions	Participants did not know about GP OOH services and their access was limited. They were unable to communicate with service, including answering services, and were unaware of interpreting arrangements. Generally, they were dependent on

				others gaining access for them; some had used 999 service. They experienced delays in gaining access to services and confusion regarding medicines and advice given.
(Houston and Pickering, 2000)	Semi-rural England	Qualitative	To understand how parents use the OOH service.	29 families purposively recruited based on amount of OOH contact. All parents had coping strategies for unwell children and felt responsibility for self-management. Fear of responsibility and making the right decision weighed against the burden a call could have on the service was prominent. Lack of social support and previous experience of services influenced the decision to call.
(Rajpar et al., 2000)	A&E and GP OOH cooperative, England	Survey	To investigate patients' reasons for choosing between A&E and GP during out of hours period, focussing on those with primary care problems.	54 A&E and 48 GP OOH patients were interviewed. Reason for attending A&E with primary care problem – 50% 'GP was closed' , but 46% had not attempted to contact GP. 22% reported perceived severity of problem. 80% of AE interviewees reported knowledge about OOH arrangements but 94% did not know about the nearby cooperative. 73% of GP OOH users had discovered the co-op on the day they used it and 31% would have preferred to see their own GP.
(Shipman et al., 2000b)	GP co-operative, GP practice-based & deputising	Questionnaire	To compare patient satisfaction with a GP co-operative, GP practice-based & deputising arrangements in one	RR 53.2& (1823 responses): 54.4% co-operative users; 47.8% from the deputising service; 54.1% from practice-

	arrangements in one geographical area, England		geographical area; to compare satisfaction with different forms of service delivery provided by the co-operative	based service. No significant difference in satisfaction overall between the services. Patients using practice-based arrangements significant more satisfied with waiting time for telephone consultations ( $p < 0.001$ ) and home visits ( $p = 0.020$ ) than deputising patients. Within the co-operative, overall satisfaction, satisfaction with GP's manner and with the process of contacting the service was greatest amongst those attending the primary care centre. Those receiving telephone advice most satisfied with explanation and advice received; however, these patients also reported increased information needs and help seeking in the following week.
(Morgan et al., 2000)	Public views of OOH care, England	Conjoint analysis sampling from 17,908 members of the public in Sheffield	To quantify public preferences for different attributed of OOH medical care.	Doctor's manner (whether he/she listens), type of consultation (home visit, telephone advice, sees A&E doctor or attends OOH centre) and waiting time for consultation best predicted public's preference for OOH care. Doctor's manner was more important than knowing the doctor.
(Foster et al., 2001)	Community groups, London	Qualitative	Explore older peoples' views of OOH services.	Focus groups – views expressed characterised by stoicism, value of having familiar GP, different views of nurse consultations, speed and ease of getting a home visit if needed,

				mobility/transport issues, less willing/able to use telephone. Insights into why older people may underuse OOH services. Men and ethnic minorities underrepresented in discussion groups.
(Shipman et al., 2001)	GP OOH, England	Semi-structured interviews	To investigate views and experiences of those who had recently attended an out of hours centre.	172/341 (50% interview rate), 72 had face-to-face consultations, 47 had a telephone consultation, 53 had a home visit. 70 of the above were with parents of children <1year old and 18 were with those over 65years old. Positive factors associated with face-to-face consultations were speed with which could see a GP, face-to face nature of contact, faster than A&E. Negative aspects: discomfort or danger of travelling or driving while unwell, arranging child care, cost of travel, unfamiliar location. Compared to those who had not been seen face-to-face similar views for why they could not attend centre. Despite negative comments 98.5% satisfied with consultation.
(Smith et al., 2001b)	Practice-based OOH care, Ireland	Questionnaire	To record patients' experience of OOH care and to elicit their satisfaction with OOH care in general	RR 58.0% (139/240 patients). 240 had requested OOH care during the 2 month study period; call rate of 195 per 1000 patients. Of these, 61.0% used the co-operative; 28.0% received a house call; and 3.0% received telephone advice alone.

				86.0% reported satisfaction with the service and most were prepared to travel to a local GP OOH centre.
(McKinley and Roberts, 2001)	GP OOH service, England	Questionnaire and routine data analysis	To investigate the relationship between patient satisfaction with OOH care and characteristics of the patients, service and outcome.	1446/2063 (71%) patients recently accessing OOH were interviewed with questionnaire. Older adults had higher levels of satisfaction as did those who had seen a practice doctor compared with deputising doctor. Delays, access to a car, patient expectations and patient perception of outcome also influenced satisfaction.
(Payne et al., 2001)	GP OOH co-operative, London, England	Qualitative study	To describe the expectations of patients, or third party callers, who contacted a GP OOH co-operative and their satisfaction with the telephone advice received	47 telephone consultations were followed up by an interview; 23 interviewees (48.9%) had expected to be offered a home visit. Reasons for wanting a home visit were due to nature of the condition or perceived severity; problems being able to attend the centre and risks of travel; or problems communicating by telephone. Satisfaction with telephone calls due to doctor being able to give reassurance and adequate time to allay concerns. Dissatisfaction associated with feeling GP could not make a correct diagnosis or being made to feel they were wasting doctor's time. Authors conclude there is a need for patients to be better informed about the service they can expect from a GP co-operative.

(Wilson et al., 2001)	GP OOH co-operative, Scotland. 1609 users	Questionnaire/Survey	To identify characteristics and reasons associated with dissatisfaction following OOH contact	RR 69.3% (1115/1609). Dissatisfaction was associated with unmet need, particularly among those expecting home visits. Parents of young children, those from more affluent areas and those experience problems accessing in-hours services were also more likely to be dissatisfied. Much of the dissatisfaction was associated with the telephone contact. Travel to the centre also an issue, especially for those with young children. Perceptions of dismissive attitude from medical staff, and of incorrect diagnoses also associated with greater dissatisfaction, as were adverse medical outcomes.
(McKinley et al., 2002)	OOH care, England. Survey 3457 patients requesting care from 5 practices, 2 GP OOH co-operatives, and a deputising service	Questionnaire/Survey	To determine the effect of 'patient expectations of care' on satisfaction with care provided by OOH services	Patients who received the care they hoped for were more satisfied than those who did not. Patients attending a centre more satisfied than those who had home visits. Meeting, or failing to meet, care patients hoped for is an important predictor of patient satisfaction with OOH care.
(Kallestrup and Bro, 2003)	GP OOH co-operative, Denmark	Qualitative	To explore parents' beliefs and expectations about the OOH service when they have a febrile child.	146 interviews. 53% of parents had discussed child's condition with others prior to the doctor. Nearly all expected an examination of their child and an explanation for their child's condition. A majority did not expect antibiotics (71%

				no, 10%, don't know).
(Scott et al., 2003)	Parents of children in Aberdeen and Glasgow who had used an OOH service or were registered with a GP	Questionnaire and discrete choice experiment	To elicit the preferences of patients and the community for different models of GP OOH care.	RR 68% (3893/5718). Parents were asked to imagine their child had respiratory symptoms, then offered different scenarios of care organisation. Most important attribute to parents was whether the doctor listened; most preferred location of care was a hospital A&E department. Waiting time valued by those had never used an OOH service.
(Glynn et al., 2004b)	OOH GP co-operative, Republic of Ireland	Questionnaire	To evaluate the relationship between self-reported health status and satisfaction with OOH services.	1203 OOH contacts in 24 days. 966 questionnaires, 531/966 (55%) responded. Respondents slightly older. Lower health status scores and more affluent socioeconomic group associated with lower satisfaction. Most dissatisfaction expressed with delays. Note that more affluent groups have to pay for GP services and this may influence their expectations and satisfaction
(Glynn et al., 2004a)	GP OOH co-operative, Ireland. 966 patients	Questionnaire/Survey	To investigate whether rurality has an influence on patient satisfaction with OOH care provided by a family doctor co-operative	RR 55.0% (531/966). Overall satisfaction high; 88% rated the service as good or excellent. Perceived rurality, distance from treatment centre or previous rota did not significantly affect satisfaction.
(King et al., 2004)	Carers identified through GP practices, England	Qualitative	To explore carers' experiences of OOH palliative care.	15 carers interviewed, key issues - crisis contact information, quality of care – communication being key, using carers

				unique knowledge, lack of knowledge on OOH doctor unfamiliar with patient, deep appreciation for in hours regular GP and district nurses and their reassurance provided by personal relationship, timely (anticipatory) and supported provision of equipment and medication. Note majority of care provided by district nurses.
(Thompson et al., 2004)	OOH GP co-operatives, Northern Ireland. 4466 users of service	Questionnaire/Survey	To assess patient satisfaction at two OOH co-operatives	RR 60.5% (2707/4466). Patients who asked to be seen at the centre were more likely to receive that contact than patients who requested telephone advice or a home visit. Only 41.8% of those requesting a home visit received one. Patients were generally satisfied with the service; they were most satisfied with 'doctor's manner' and the 'explanation and advice' received. Patients who received the contact they originally requested were more satisfied; this was more indicative of satisfaction than the type of contact requested.
(Gerard et al., 2004)	NHS Direct callers; Adults attending A&E, GP services, NHS walk-in centres, England. 620 adults	Discrete choice experiment	To investigate patients' strengths of preferences for attributes associated with modernising delivery of OOH services in one city	RR 74.0% (457/620); 61% (378) were usable. All attributes were statistically significant. Most important attribute was being seen by a doctor; followed by being seen by a nurse, being kept informed about waiting time, and

				<p>quality of the consultation. Respondents were prepared to wait an additional 2 hours 20 mins to be seen by a doctor.</p> <p>There were no preference differences between respondents from different services. Younger respondents preferred single telephone access; services close to home and being seen in person were important, but less so than the above attributes.</p> <p>Authors suggest this means that a range of service locations may be acceptable to patients.</p>
(van Uden et al., 2005a)	GP OOH co-operatives, The Netherlands	Questionnaire survey	To examine patient satisfaction with current OOH care organised in GP co-operatives and to gain explore the factors associated with this satisfaction.	<p>RR 42.4% (1160/2733).</p> <p>~80.0% of patients visiting GP co-operative or receiving a home visit were satisfied with care; 67.0% of patients receiving telephone advice were satisfied.</p> <p>Factors associated with satisfaction included: attitude of doctors' assistants on the phone; opinion on GP's treatments; and waiting time.</p>
(van Uden et al., 2005c)	GP OOH co-operative, the Netherlands. 2805 users	Questionnaire/Survey	To determine the proportion of patients who seek follow-up care after OOH contact and to explore factors related to the follow-up	<p>RR 42.4% (1160/2733).</p> <p>48% of patients received follow-up care from their own GP. Only 20% were referred or advised to attend their own GP, by the OOH service. Others attended because their medical condition worsened or they were concerned about their condition.</p>

				Variables predicting follow-up care were patient's opinion on correctness of the diagnosis, patient's health insurance and severity of the medical problem.
(Gerard et al., 2006)	General public via GP lists, England	Discrete choice experiment postal questionnaire	To ascertain what the public considers the most important for OOH services.	RR 871/2408 (37%) returned. Respondents valued ooh contact with services for reducing their anxiety. They also expressed preferences for the way the service was organised, preferring to be seen by a GP and in person; and valued information about expected waiting time. They were most willing to make trade-offs between waiting time and which professional saw them (i.e. would wait up to 58 minutes longer to be seen by a doctor). Utility scores also higher for a fully integrated call management model. All models presented were valued more highly (i.e. were more desirable) than waiting for GP surgery to re-open. <b>N.B.</b> Authors comment in abstract on problems in obtaining a representative sample of the public.
(Campbell et al., 2006)	In-hours and OOH primary care, Scotland. 78 patients	Qualitative study	To explore whether, and how, patients' consulting intentions take account of their perceptions of health service provision	Anticipated waiting times for appointments affected consulting intentions, especially when symptom severity was uncertain. In cities, strategies to deal with this, included: booking early just in case, being assertive, demanding visits, or

				calling out-of-hours. In rural areas, participants used relationships with primary care staff, and believed that being seen as undemanding was advantageous. Out-of-hours, decisions to consult were influenced by opinions regarding out-of-hours services. Some preferred to attend nearby emergency departments or call 999. In rural areas, participants tended to delay until their own doctor was available, or might contact them even when not on call.
(Kelaheer et al., 2006)	After hours care, Australia	Telephone survey of users and non-users of after-hours care. 5538 users; 891 non-users	To examine the effects of socioeconomic disadvantage on access of after-hours care and episodes of non-seeking OOH care.	Factors determining access to after-hours care included accessibility (i.e. structural barriers, such as distance and travel), as well as affordability and availability.
(Worth et al., 2006)	OOH primary care, Scotland. 36 palliative cancer patients and caregivers; 50 GPs and other health care professionals	Qualitative study	To explore experiences and perception of OOH care of patients with advanced cancer, and with their informal and professional carers	Patients and carers had difficulty deciding whether to call OOH services due to anxiety about legitimacy of need, reluctance to bother doctor, perceptions of triage as blocking access to care and of OOH care as impersonal. Positive experiences related to effective planning, particularly transfer of information, and empathic responses from staff. Professionals concerned about delivering good palliative care service within a generic acute system and problems accessing other health and social care services.

				Authors conclude that OOH service configuration and access based on acute illness needs and biomedical criteria. This fails to take account on the complex needs associated with palliative and end-of-life care.
(Giesen et al., 2007b)	OOH GP co-operatives, The Netherlands	Questionnaire	To identify those factors associated with negative patient evaluations of nurse telephone consultations and OOH accessibility.	2583/5239 (49%) questionnaires. Scores for most measurements were satisfactory. Older people were less negative. Where there was expectation mismatch there was less satisfaction, and less satisfaction associated with living further away or having a chronic illness. Variation between co-ops. Low response rate, non-response analysis inconclusive.
(Halter et al., 2007)	GP OOH Service, London	Telephone questionnaire	To evaluate patient satisfaction associated with Emergency Care Practitioner home visits	174 eligible, 63 excluded. 111 contacted after home visit, 81 (73%) completed survey. 59/60 (98.3%) not admitted to hospital felt care received was right and/or followed treatment advice. 86% of 81 felt clear about the ECP assessment, 58% felt health was better after home visit. 39% of those referred on after home visit were not seen and 38% of those not referred on were seen by another health care professional – suggesting unclear instructions/management. Note no comparison with GPs and small sample size.
(Howard et al.,	OOH services, Canada	Questionnaire	To compare patient satisfaction of care	5 884/9 397 (62.6%) responses.

2007)			received in different settings.	Satisfaction higher among patients seeing their own GP compared to A&E, walk in clinic or telephone service. Older age and better self reported health statuses also associated with higher satisfaction.
(Richards et al., 2007)	OOH co-operative , England	Focus group discussions and telephone interviews.	To explore patients' experiences of out of hours services.	22 in focus groups and 5 telephone interviews. Themes identified: deciding to call, getting through to the service, triage of calls, waiting for call back/home visit, location of consultation, quality of care, access to medical history and collecting medication. Evidence that patients' decision to call is complex and often people worry about the burden they put on the system. And patients' concerns are related to quality and safety.
(Horrocks and Salmon, 2007)	OOH, England. 19 participants	Qualitative study	To explore and compare experiences of older people and parents of young children following transfer of OOH responsibility from GPs to a PCT.	Older people presented with more complex health problem than young children and expressed more reluctance at calling the service. Both experience similar access problems using the primary care centre, e.g. travelling to centre. Older people more likely to get a home visit, but had continuity issues if problem persisted. Both groups questioned ability of GP to make accurate assessment by telephone.
(Glynn et al.,	GP OOH co-op,	Questionnaire/Survey	To analyse qualitative comments made	Free text comments in 187/531

2007)	Ireland. 531 users		by respondents in a questionnaire exploring patients' satisfaction with oOH service	questionnaires (35%); these were thematically analysed. Five themes emerged: service availability, service accessibility, efficiency, continuity of care and quality of care. Availability and accessibility of the OOH co-op gave parents 'peace of mind', although travelling to a centre was often problematic. Some parents were concerned about confidentiality. There was evidence of parents making 'trade-offs' with respect to options of OOH care, with OOH co-op viewed as a <i>service</i> which can be readily contacted.
(Moll van Charante et al., 2008)	A&E and GP OOH co-operative, the Netherlands. 808 contacts with A&E; 5547 contacts with co-op. Focus on 339 self-referrals to A&E	Questionnaire/Survey	To determine reasons for self-referral to A&E department and to compare characteristics of these self-referrers to patients contacting GP co-op	There were 344 self-referrals to A&E (43.0% of total), who were sent questionnaire. RR 66.0% (224/339 usable). Main reasons to visit A&E were: perceived need for diagnostic facilities; conviction that a hospital specialist best qualified to handle to problem. Self-referral to A&E positively associated with injury; age 15-64; musculoskeletal, CVD and respiratory problems; and distance to GP centre. 28% expressed dissatisfaction with GP co-op. Main reasons were unfriendliness of the nurses, long waiting times and lack of diagnostic facilities. Note: There was no attempt to judge

				'appropriateness' of the self-referrals.
(Egbunike et al., 2008)	GP OOH services, Wales. 30 participants	Qualitative study	To explore patient expectations and help-seeking behaviour	Most respondents reported satisfaction with the overall service, but a few were dissatisfied. Patients generally had specific expectations of their consultation and there was a mismatch between expectation and what was actually provided for some groups. Unmet expectations resulted in subsequent and even multiple consultations.
(Hugenholtz et al., 2009)	GP OOH co-operative, The Netherlands	Qualitative	To explore parents decision making regarding seeking medical attention for a sick child.	52 case reviews and 19 semi-structured interviews. Change in the child's behaviour or appearance initiated concern. Parents wanted to avoid risk and to exclude serious illness. Authors suggest that societal zeitgeist of risk aversion and health awareness encouraged parents to seek help more often in order to exclude serious illness.
(Campbell et al., 2009)	OOH care, England. 1249 service users	Questionnaire/Survey	To investigate OOH service users' views of OOH care in the light of UK national service quality (NSQ) requirements	RR 50.2% (627/1249). Compared users' experience to NSQ standards (time until call answered; time waiting for call-back; time waiting for home visit; time waiting at centre). Standards met for about 2/3 of respondents. However, this was not well rated. Even when home visit occurred within 1 hour, only 1/3 respondents rated this as 'excellent'. Poor evaluations associated with delays receiving care and with gender (female

				gender assoc with delays for call-back and for home visit). Users have high expectations of OOH care. Authors estimate that for 50% to rate service 'excellent', calls would have to be answered within 30 seconds, call-back within 20 mins, waits for home visits less than 1 hour and waits and centres of less than 20 mins.
(Carlebach and Shucksmith, 2010)	Out of hours palliative care telephone service, England	Qualitative in-depth interviews	To explore patient, carer and health professional views of the service.	27 interviews. Most who used the service were carers then patients. Views described were positive and quote patients and carers who found the support and advice to be personalised.
(Kelly et al., 2010)	OOH services, Wales	Questionnaire	To identify factors associated with patient satisfaction and enablement in different OOH services.	3250 OOH users, 855 (26%) responded. Age and gender non-responder analysis -no significant difference. OOH centre consultation associated with lower satisfaction compared with telephone advice. Odds of satisfaction reduced with increasing waiting time for call to be answered or for a callback and with shorter consultations. Odds for 'enablement' were less if reported a long term illness, if seen at centre compared with telephone advice, if there was delay in answering call. Note low response rate.
(Egbunike et al., 2010)	GP OOH services, Wales. Three locations: GP co-op, hospital-based and	Qualitative study	To explore users' needs, expectations and experiences of OOH care, and to identify proposals for service redesign	Users concerns were similar across the three locations. Repetitive triage procedures and time delays across the process were particular problems.

	private providers. 60 service users or carers			Expectations moderated the relationship between user concerns and satisfaction. Where expectations of outcome were unfulfilled, participants reported greater likelihood of re-consulting.
(Philips et al., 2010a)	GP OOH care, Belgium. 350 respondents	Questionnaire/Survey	To explore consumers' experiences of GP OOH service and to identify their preferences for OOH care	Identified sample through the Newborn and Child health care service, as parents of young children/infants known to be high users of OOH care. Final sample of 350 (unclear how many approached, no RR given). Whereas 98.6% of respondents knew about the ED, only 81.7% knew about the GPDS (the GP OOH service). Main reasons for preferring ED over other services was easy access, good explanation by doctor and a late due time of the payment. Respondents preferred the GPDS because of an expected shorter waiting time. Experience had a strong positive influence on choosing a particular after-hours medical service.
(Turnbull et al., 2010)	GP OOH co-op, England. 5697 calls about children; review of 80 call recordings; 8 interviews with parents	Mixed methods	To examine if telephones overcome geographical barriers to accessing primary care OOH by parents of young children	Call rates for children aged 4 and under decreased with increasing distance; 570/1000 patients pa (95% CI 558 to 582) for 20% living furthest away vs 652 (95% CI 644 to 661) for 20% living closest. Call rates decreased with increasing rurality. Interviews suggested this variation linked to familiarity with

				the system (particularly previous contact with health services) and availability of services, legitimacy of demand (particularly for children) and negotiation about mode of care.
(Kinnersley et al., 2010)	OOH services, including GP OOH services, A&E and NHS Direct, Wales. 3250 service users	Questionnaire/Survey	To identify strengths and weaknesses of OOH service provision in Wales	RR 26.0% (855/3250). Consistent strengths across provider and types of care were: the manner of the call operator and explanations given by call operator. Consistent weaknesses were: speed of call by clinician, the information given by the GP, difficulties access medication after the consultation and deciding when to contact an in-hours GP. Authors conclude that areas for improvement include the interfaces between in-hours and OOH care and between OOH care and self-care. Users require better signposting and information on when to access in-hours and OOH care.
(Carr-Bains et al., 2011)	GP co-operative, England	Survey	To investigate patients' experiences and satisfaction with home visits from one co-op.	229 (54%) questionnaires received from 425 sent a questionnaire and who had received a home visit. 72.5% wanted a home visit. Most would have called an ambulance or gone to A&E if OOH service did not exist. 87% satisfied or very satisfied with service. Less satisfied with time waiting to speak to or see a clinician.
(Poole et al.,	OOH services, Wales	Qualitative	To explore patients' out of hours	Free text analysis of surveys. 3250

2011)			experiences and their suggestions for service improvement.	issued, 855 returned, 341 (40% of returned, 10% of issued) provided free text. Themes identified were accessibility (subthemes of waiting time, problems with home visits, difficulty accessing a service/medication/face-to-face consultation), ineffective triage, quality of communication, lack of consideration to parents of children, satisfaction with treatment, users' ability to cope with condition. Recommendations were around improving accessibility, reducing waiting time and improving both doctors' communication and the triage process.
(Richards et al., 2011)	OOH primary care; England. 28 palliative cancer patients and/or caregivers	Qualitative study	To explore the experience of people with advanced cancer and/or their caregivers accessing OOH care	Two main themes identified: legitimacy of help seeking and continuity of care. Most participants were reluctant to seek help, finding it difficult to decide whether their needs were sufficient to contact services. Services could legitimise participants' requests; distress arose when services were dismissive of patient needs. Respondents were appreciative of clinicians who provided them with reassurance. Consulting with an unfamiliar clinician out-of-hours raised doubts in some participants' minds about the quality of care and there were sometimes

				<p>problems with pain management. While delivery of out-of-hours care as a whole was not always perfect, around-the-clock access to professional sources of support and reassurance was highly valued. However, the transfer of information to out-of-hours providers remains a key challenge; participants did not understand why out-of-hours providers could not access patient histories via IT. There is therefore a need to improve continuity between in-hours and OOH services for patients with complex needs.</p>
(Brown et al., 2012)	Urgent care telephone triage, England	Questionnaire based telephone interviews.	To evaluate users' experiences of a new single point of access telephone number.	34509 calls, 1626 (4.7%) agreed to interview, 493 (30.3% response rate) people interviewed. Most satisfied, even if advice different from what expected. Deprivation and not having access to a car more associated with preferring a visit from a clinician. People less satisfied with repetitive nature of questioning and time to wait for call back. 14/493 did other than advised. Most advised to attend centre.
(Philips et al., 2012)	Computer simulated discrete choice experiment using data from 350 users of three free health care centres in a European	Discrete choice analysis	To investigate the criteria patients use to choose out of hours care and to provide a projection of the future market share for a newly establish GP OOH co-operative service.	The two most important attributes when people deciding whether to use an OOH service were: 'explanation by doctor' about the problem and treatment and 'waiting time'. 'Availability of technical equipment',

	city			<p>'ease of access', and 'payment method' were less important.</p> <p>Market share projections predict the new GP co-operative will capture about one-third of the market ahead of the emergency service, which was the next most preferred model. (Adults: 39.1% vs 32.7% for co-op vs emergency dept. Children: 31.3% vs 30.7%).</p> <p><b>N.B.</b> Percentage of study population 'foreign origin' was 44.3% cf 26.8% in city overall; suggests not representative overall and have to use a free clinic service.</p>
(Smits et al., 2012)	GP OOH co-operatives, The Netherlands	Longitudinal observational study using validated patient satisfaction questionnaire; Survey in 2003-04 (T1) and 2007-08 (T2)	To examine changes in patient satisfaction with GP co-operatives over time	<p>RR 55.0% in T1 2003-04 (2634/9600 patients); 51.0% in T2 2007-08 (2462/9600).</p> <p>Care at GP co-operatives met the expectations of most patients (T1 86.1%; T2 88.4%). Patients satisfied with triage nurses, GPs and organisation of care. Lowest levels of satisfaction observed for waiting times and information about the co-operatives. Little known about satisfaction of specific patient groups.</p>
(Arain et al., 2013)	2 x GP led Walk-in clinics, North of England	Questionnaire at visit and post visit questionnaire	To determine patient satisfaction and experiences of Walk-in clinics.	<p>Response rate 64% (501) and 51% (529) from centre A+B. No sig difference between responders and routine data for attenders (age, sex, time). 50% used because of quick access, 9% reported GP closed, 20% reported unable to see</p>

				own GP due to work hours. 65% responders from OOH period. Majority highly satisfied with location and opening hours. 90% followed treatment/advice completely. Reduced satisfaction with longer waiting times. Many use subsequent services after WiC.
(Leydon et al., 2013)	Patients identified through GP practices, England	Qualitative	To examine patients' experiences of end of life care and explore their use of OOH care.	24 indepth interviews, with repeated contacts over time, 2 key themes – <b>continuity</b> : 'being known' was reassuring, relationship continuity as well as clinical management continuity; <b>determinants of OOH use</b> : poor prior experience, poor knowledge of who and when to call. Continuity or lack of it was the main theme and explained a lot of reluctance to contact OOH.
(Philips et al., 2013)	GP OOH and A&E, Belgium	Mixed methods	To explore the awareness and ideas that patients have regarding the co-payment system and ways to minimise overuse of A&E.	Questionnaire – 787/985 (80% response), 72% of respondents aware of co-payment system, very few (11%) knew the amount. Not knowing about co-payment was higher at A&E than GP. Reasons given for choosing A&E: accessibility, competence of staff and proximity. Only 0.5% felt the co-payment postponed an A&E visit, no spontaneous mention of co-payment when discussing choice influences. Patient suggested information being the key to redirect patient flow from A&E to GP.

(Langer et al., 2013)	Unscheduled care (UC) in general (including OOH care)	Qualitative systematic review	To understand the breadth of psychosocial and other influences on UC use in people with long-term conditions	Starting point was often the 'problem' of UC, and health care, use in general with use decontextualized from people's lives. Patients' use of UC emerged as understandable, rational responses to pressing clinical need, where patients thought it their only option. This reflected the value they place on UC versus routine care through previous experience. For marginalised patients, UC offered access to care that was otherwise unavailable to them.
(Huibers et al., 2013a)	Primary care physician co-operatives, The Netherlands. 16 co-operatives. Questionnaire to sample of 13,953 patients	Mixed methods	To examine whether patient experiences with nurse telephone consultations and the co-operative's organisational characteristics were associated with probability of follow-up contact	RR 50.4% (7039/13,953), with 5678 complete. About half of patients (47%) reported a follow-up contact. Increasing probability of follow-up contact in older patients (OR 2.39 for 65 yr+), patients receiving home visit (OR 1.32) and co-ops with higher percentage of telephone consultations (OR 1.02). Decreased probability for patients with more positive experience with nurse telephone contact (OR 0.68). Authors conclude a 'substantial number' of follow-up contacts not for medical reasons, but for reasons that are potentially avoidable (e.g. by changes in work routine and communication).
(Gallagher et al., 2013)	GP OOH co-operative, Ireland. 34 interviews	Qualitative study	To describe users' with chronic conditions, and their caregivers',	Those with 'routine trajectories' were largely satisfied with their experience of

	conducted with 41 adult service users		experiences of continuity of care in an OOH GP co-operative	OOH care. Those dealing with 'problematic trajectories', e.g. with multimorbidity and/or complex care regimes, had considerable concerns about continuity of experiences in the service. Authors suggest that policies that have led to OOH co-ops have had a differential impact, with serious consequences, on service users with chronic conditions and their caregivers.
(O'Cathain et al., 2014)	111 service, England. 4265 users.	Questionnaire/Survey	To explore acceptability of 111 service to users	RR 41% (1769/4265). 65% found advice given had been very helpful; 28% quite helpful. Most (86%) had complied with the advice given. 73% were very satisfied with the service overall; 9% quite satisfied. Users less satisfied with relevance of the questions asked, accuracy and appropriateness of advice given. Users autorouted to 111 from other services, including GP OOH services, were less satisfied than direct callers.
(Zhou et al., 2015)	Primary care, England	Routine analysis of data from 567,049 respondents to 2011-12 English GP Patient Survey	To explore associations between patient-reported measures of ease of access to in-hours primary care and use of OOH primary care services.	Worse in-hours access was associated with greater use of OOH care for each in-hours access variable studied (ease of getting through on telephone; ability to see preferred GP; ability to get urgent or routine appointment; convenience of opening hours. After adjusting for access and patient characteristics, worse access

				independently associated with increased OOH access for all measures except telephone access. Assuming causality, authors estimated an 11% RR in use of OOH care if access to in-hours care was optimal.
(Warren et al., 2015)	OOH GP services, England. General Practice Patient Survey 2012-13, 971,232 respondents	Questionnaire/Survey	To investigate experience of users of OOH GP services in England	RR of survey 35% (971,232/2,750,000). Assessed three outcomes: timeliness, confidence and trust in the OOH clinician, overall experience). Commercial OOH providers associated with poorer reports of overall experience of care cf not for profit providers: mean difference -3.13 (95% CI: -4.96 to -1.30). Asian service users reported lower scores across all three outcomes cf white service users: mean difference overall experience -3.62 (95% CI: -4.36 to -2.89). Service users unable to take time off work reported lower scores cf users who did not work: mean difference overall experience -4.73 (95% CI: -5.29 to -4.17).

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