



# Effective approaches to hub and spoke provision: a rapid review of the literature

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## Executive summary

There is no agreed definition of hub and spoke provision. A variety of terms are used to describe hub and spoke or variations of hub and spoke models of service delivery, including clusters, networks and satellites.

The review identifies 10 models of hub and spoke provision including:

- Multiple hubs;
- Hub with satellite sites;
- Hub and spokes, sometimes called a cluster;
- Hub provides one stop shop facility;
- Hub provides central specialised care and spokes provide core services;
- Hub is strategic centre with strategic lead;
- Hub provides core leadership;
- Virtual hub;
- Informal or formal networks of services;
- Hub acts as emergency or crisis response team.

Hub and spoke models were identified in the following areas: healthcare (14); children's centres (5) and youth services, specifically Connexions (01).

Different agendas have driven the development of hub and spoke models in different sectors. In both mental and physical health services, a deliberate choice has been made to set up hub and spoke models of service delivery. Whereas children's centres and initiatives for young people have tended to develop more organically over time, responding to changes in funding streams, local agendas and the changing needs of the service user group.

Assessing the impact of hub and spoke service provision is hampered by a lack of effectiveness evidence. Many of the evaluations of children's and young people's services assess pilot programs or large-scale initiatives where hub and spoke models have been identified but only moderately appraised as a bi-product of the wider evaluation. This makes it difficult to untangle which successes or challenges can be attributed to the hub and spoke model itself.

Where evidence exists, evaluations of healthcare provide the best data on the effectiveness and cost-effectiveness of hub and spoke models of service provision, demonstrating that hub and spoke models are more likely to:

- Increase numbers of people accessing and engaging in treatment
- Get patients into treatment faster
- Be more cost effective.

The deliberate decision to set up hub and spoke provision appears to impact positively on outcomes for services users.

A series of contextual factors determine both design and delivery as well as the success of the model. These cohere around macro level themes such as the policy context and commissioning, funding, changes in strategy and leadership, through to operational and service delivery factors and down to micro layers regarding service user expectations and experiences.

The views of service users and carers are not routinely included in evaluations of hub and spoke. The little research evidence that exists suggests that this is an acceptable and accessible model of delivery but more research is required to understand what works best from the perspectives of service users themselves.

By drawing on these emerging themes, some recommendations for existing and future models of hub and spoke delivery are offered as followed:

- Changes and cuts to funding can adversely affect the continuity and consistency in the role of the hub and the spokes. Contingency planning around different management structures and operational procedures may help reduce the impact on vulnerable service users requiring specialist support.
- Formalise systems for managing data and information sharing between the hub and spokes. Consider the bi-directional flow of information, the practical issues of accessing databases and the cultural diversity of multi-agency working. Ensure procedures for information sharing are underpinned by policy.
- The hub and spoke model appears to adapt well to services attempting to extend reach across marginalised groups as well as geographical areas. Be mindful of spokes feeling isolated and/or excluded from the central hub and build in support structures for workers.
- The telestroke service provides a valuable insight into the role that technology can play in sharing expertise and specialist knowledge remotely between hub and spokes. Think about the role of technology such as videoconferencing to access expert advice (as well as support) in the spokes.
- In hub and spoke models using multi-agency collaborations, consider the impact on voluntary and community sector identities and profiles. Consider how the hub may overshadow the spoke's identity for example as a specialist charity. Build in early discussions about branding, publicity and the profiles of the hub and spokes.
- Embed service user participation into the design, delivery and monitoring of services. Be creative but realistic about how and when service user involvement will be most effective to ensure it is meaningful. Explore partnering with an external agency with a track record of expertise in this field.

## **1. Introduction**

Despite receiving increased attention within the public policy agenda and a heightened media profile due to a string of complex police investigations, child sexual exploitation (CSE) continues to be under-reported and under-resourced in many areas of the UK. While statutory sector responses are improving, substantial gaps remain in the availability of specialist provision for victims of CSE[1]. At the same time, funding cuts imposed on local authorities suggest that such gaps in specialist provision will continue into the future.

### **1.1 The Child Sexual Exploitation Funders' Alliance (CSEFA)**

Concerned that the climate of cuts might cause voluntary sector services to contract, a group of charitable funders have created an alliance in order to bring about a step change in how CSE is dealt with across the UK. The Child Sexual Exploitation Funders Alliance (CSEFA) is funding a rolling program of up to sixteen 'hub and spoke' services across England over three years in order to position CSE as an integral part of mainstream safeguarding activity. It comprises three key programmes of work:

- The development of a *hub and spoke* model of specialist service provision
- The promotion of the meaningful involvement of children and young people in decision making and the development of good practice in CSE practice intervention
- Creation of a knowledge hub on CSE to pool and share knowledge about CSE and the evidence base for good practice.

CSEFA has commissioned the International Centre: Researching child sexual exploitation, violence and trafficking at University of Bedfordshire to conduct a realist evaluation of the sixteen hub and spoke models. The evaluation will report on the their effectiveness in expanding the geographic and demographic reach of specialist services and their potential to trigger cultural and systemic change in the way that children's services respond to CSE.

### **1.2 Research review questions**

In order to support development of University of Bedfordshire's work this review explores effective approaches to hub and spoke provision.

It aims to identify and describe:

1. Different models of hub and spoke service provision, including context and characteristics;
2. Evidence of their effectiveness, with a focus on the outcomes achieved;
3. The factors promoting and hindering the success of these models;
4. The perspectives of people who use services and their carers.

### **1.3 Methods**

The methods used to identify and organise material in this review were developed by the Social Care Institute for Excellence (SCIE)[2]. In total, 48 items were identified of which **20** met criteria for inclusion for review. The majority (12) are research reports with eight items identified as journal articles (see appendix A for full search strategy write up).

Consultation with the project team identified this as an area where practice was likely to be ahead of the research. This meant undertaking searches on topics beyond CSE to capture learning from the wider literature on the effective approaches to hub and spoke service provision. In agreement with the commissioners of the review, initial topics included:

- Children's services including children's centres.
- Targeted youth services.
- Drug and alcohol services.
- Sexual health services, and
- Disability services.

These topics were identified both because of direct relevance to CSE e.g. children's services and sexual health services but also recommendations to search for hub and spoke models in the area of disability. However, initial searches revealed a more limited number of evaluations than anticipated. Following discussion, a second phase of searches were undertaken to identify evaluations of mental health and physical health services more generally. It was also agreed to expand searches to locations beyond the UK.

In order to be included for full review, items had to be an evaluation study. Studies reporting the views of children, young people, parents/carers were also included. This reflects the aims of the review to understand the perspectives of people using hub and spoke services; evidence unlikely to be identified via a focus on evaluation studies only. Items included both research reports and peer reviewed journal articles as well as English language, international studies. Only items after 2003 were included. This date was chosen to capture changes in children's services following introduction of the Government initiative in England and Wales, Every Child Matters [2].

### **1.3.1 Map of the literature**

Hub and spoke models were identified in the following areas: healthcare (14); children's centres (5) and youth services, specifically Connexions (01).

The majority (6) of healthcare papers focus on mental health services. These include services for people experiencing psychosis, including borderline personality disorder (4); emergency access to psychiatric treatment (1); and improving access to psychological therapies (1).

The other eight papers address the following: cancer services (2); healthy living centres (1); oral healthcare (1); sexual health services (1); stroke services (1); teenage healthcare (1); and one assessing clinical networks of care, including hub and spoke models (1).

The majority (15) of papers are from the UK; Australia (2); United States (2) Canada (1)

### **1.4 Definitions**

There is no agreed definition of hub and spoke provision. A variety of terms are used to describe hub and spoke or variations of hub and spoke models of service delivery, including clusters, networks and satellites. In some instances, such models are described as moving beyond hub and spoke[3].

For the purposes of this review, we have adapted the definition developed by Goff et al.'s (2013) in their evaluation of Children's Centres in England (ECCE). Following recent structural reconfigurations, they make a distinction between hub and spoke and cluster models of service provision described as:

Hub-and-spoke model: a hub centre has responsibility for co-ordinating services across one or more satellite or 'spoke' centres. Hub centres have their own leaders, and spokes may or may not be led by an individual centre manager (or deputy). The hub may provide core services that are not available in spoke centres.

Cluster model: a group of two or more centres collaborate. This may be on an informal basis, or more formally as a designated locality cluster... usually located in the same geographical area. Centres each have their own centre leaders but leaders (and other staff) agree to collaborate on specific areas of work, or one centre may lead a specific piece of work which is then shared across the cluster[4].

It should be noted that the evaluation found blurring of boundaries between hub and spoke and cluster models, making it challenging to differentiate between them. This reflects the wider literature where a wide range of terms is used to describe hub and spoke or variations of hub and spoke models of delivery.

## **2. Different models of hub and spoke provision**

Table 1 provides a matrix of models table to identify variations in hub and spoke models. The leadership and management, context and characteristics are not mutually exclusive of each model but are often seen as blended combinations, making ‘pure’ definitions of a hub and spoke model difficult to pinpoint. Nevertheless, there is evidence of sufficient overlap to identify common lessons learned about the factors that promote and hinder success of these services[3-6].

The literature can be divided into four categories;

- Children’s centres including their forerunners and overseas counterparts
- Holistic health initiatives for young people e.g. healthy living centres and the teenage health demonstration sites
- Mental health services (early intervention and emergency services)
- Physical / general health services.

### **2.1 Children’s Centres**

Children’s Centres document the most diverse range of model examples. Some are single sites with a single manager overseeing all aspects of service delivery. There are formal clusters where the structuring of the leadership allows the centres to work in collaboration and more informal clusters where centres work collaboratively to offer services across a locality whilst retaining separate leadership. Some are referred to as strategic centres with a strategic manager in place to coordinate data and evaluative procedures across other centres. In addition to these are ‘virtual children’s centres’. In this type of centre, outreach work within the community is prioritised without the presence of an administrative children’s centre base or hub. Instead, the address of the children’s centre might be that of a school, but all services are coordinated throughout the local community. As a result the ‘spokes’ are often outsourced to voluntary and independent sector organisations[4].

### **2.2 Holistic health initiatives for young people**

Healthy living centres (HLCs) were intended to help people of all ages improve their well-being, both physical and mental, and get the most out of life. In the evaluation of HLCs there was a clearer distinction between models; those centres which have incorporated all, or the majority of their activities in one physical location, and a more ‘dispersed’ model of healthy living centre. The dispersed models either use a hub and spoke approach with one or two main centres and activities also taking place in a number of locations, or there is a network or umbrella organisation where most activities are delivered in different locations by a number of partner organisations.

Most HLCs are modelled on some variant of a network or ‘hub and spoke’ model, with central administration and a set of activities, some of which may be dispersed across a number of sites or provided by a range of different organisations. At the most ‘dispersed’ end of this continuum there is what is sometimes referred to as a ‘healthy living network’, or sometimes as a ‘virtual’

healthy living centre. These centres were usually set up by a group of organisations who formed themselves into a partnership to run a variety of activities in a variety of locations. Activities are mainly run by partners rather than by a centrally appointed staff team[6].

The Teenage Health Demonstration Site (THDS) programme aims to demonstrate different approaches to enhancing services in order to promote the health and well-being of young people in the broadest, holistic sense and particularly targeting the 30% most vulnerable young people in the local population. Its evaluation identified that two of the sites (Bolton and Hackney) provide services to young people on a 'central hub with spokes model'. The hub is a young person's holistic health and well-being centre with: flexible opening hours; drop-in and by-appointment clinic sessions; support and activity-based groups; and a range of specialist staff. The hub acts as a centre of excellence that brings together multiple agencies, where previously services were provided by single agencies working in parallel and often in isolation. The spokes are a range of neighbourhood-based services for young people who are unlikely to access the central hub[7].

### **2.3 Mental Health Services**

In Crawford's evaluation of community based services for people with personality disorders, it is identified that 9 of the 11 pilot services were loosely based on a 'hub and spoke' model: an intensive therapeutic hub addressing the needs of individual clients, together with some commitment to enhancing the capacity of voluntary and statutory health, social care and other agencies around them to work effectively with this user group. Plans for the pilots were strongly influenced by the Department of Health brief, which asked services to provide both direct services for people with personality disorders and to include methods for supporting others in their work with this group. In other words, the model was encouraged as the means by which to embed good practice among professionals working outside a mental health context[8].

The Somerset Team for Early Psychosis (STEP) is a specialised service for young adults (14– 35 years) experiencing, or at high risk of developing, first-episode psychosis. The hub and spoke model was developed in response to the challenge of developing a service in a large rural area and the need to integrate with existing mental health services, including the local CAMHS team, inpatient unit, community mental health teams (CMHTs), crisis resolution and home treatment teams, and general practitioners (GPs). The consultant and assistant psychologists based at the hub support the spoke teams. Although, initially envisaged that the spoke teams would be sited in non-statutory youth agencies, spoke workers were based in offices alongside existing mental health teams to allow effective liaison and use of Trust data systems. However, support is delivered almost exclusively in community settings, such as clients' homes or local cafés[9, 10].

Similarly, the Early Psychosis Intervention (EPI) service was set up in Ontario, Canada in response to the challenge of translating best practice developed for urban high-population areas to rural and remote settings. The main goals of

EPI are to improve early detection, improve access to services, promote recovery and improve long-term outcomes for young people experiencing psychosis. The study by Cheng *et al.* (2013) is one of the few evaluations drawing on comparisons between data from two different programme models: hub and spoke and specialist outreach[11].

In the hub and spoke programme, the hub is located in a central, urban area, with a full complement of EPI service providers. The spokes are satellite sites of the EPI service with access to and clinical support from the hub. Within the spoke sites, all clinicians provide general clinical mental health care. One or two members of the team are further trained as EPI ‘specialists’, providing direct service and acting as EPI consultants to other team members. The program involves eight member agencies involving both hospital-based and community-based institutions.

The eight agencies collaborate based on a memorandum of understanding, and the program is managed by a joint management committee comprised of directors from each of the eight member agencies. This joint management committee has direct oversight and fiscal responsibilities for all operations. The frontline staff of the program are employed and supervised directly by each of the partner agencies, with one agency acting as lead in terms of funding arrangements and one coordinator who travels to the sites to maintain consistency and quality across the network[11].

Another variation of the model set in mental health provision is identified in the American literature detailing a hub and spoke approach to emergency treatment for psychiatric services. The emergency department acts as a hub, with spokes radiating to and from various mental health, medical, and social services. The goal is to channel patients to the most efficacious and efficient treatment, depending on the circumstances affecting patients, such as their diagnosis, specific stressors, social circumstances, and phase of life. The spokes are bi-directional, because many patients are referred to the psychiatric emergency department by other services for acute stabilization. The key spokes radiate to all outpatient clinics, day centres, and case management systems and to transitional housing, employment and substance misuse treatment programs[12].

## 2.4 Physical/General Health Services

The literature on physical or general health services is drawn from a miscellaneous and unrelated group of services including: cancer services[13, 14]; dental services[15]; sexual health services[16]; and stroke services[17]. Most services cohered around a more conventional understanding of a hub and spoke model, with a centralised hub and spoke centres. However, one service aimed at stroke patients made use of telemedicine as a vehicle for sharing expertise between the hub and spoke hospitals via web based technology such as videoconferencing and medical cameras. This allowed specialists in stroke care to remain at the hub but support the administration of treatment to the spokes, thus building capacity for specialist care[17].

Alongside these specific health service evaluations was a paper drawing on the concepts of networks across different sectors to inform learning for health care services. This study examined seven health networks concerned with cardiac heart disease, health services for children with long-term health problems, and self care for people with current or recent mental health problems. In these models, there is no hub as such, rather a series of networks that have come together voluntarily, either through a shared interest in performing common tasks, or have been created 'from above' by NHS management typically by taking control of pre-existing networks or, in some cases, re-structuring them[3].

Such networks have been described as moving beyond 'hub and spoke' models of service delivery with the network acting as the managing organisation rather than individual services[3]. Cheng *et al.*'s paper on early psychosis interventions also referred to a move toward a network of services. This was because the hub and spoke model is considered to be hierachal whereas networked services considered their collaboration as more equal[11].

**Table 1 Matrix of hub and spoke models**

<b>Model</b>	<b>Management structure</b>	<b>Context and characteristics</b>	<b>Example</b>
Multiple hubs	Single manager	<ul style="list-style-type: none"> <li>• All hubs provide same core services</li> <li>• To provide reach across large geographical area (possibly rural)</li> </ul>	Children's centres[4]
Main hub with satellite sites	Single manager	<ul style="list-style-type: none"> <li>• Hub provides core service and satellites provide specialist services</li> <li>• Spokes may also be soft entry points to the core service</li> </ul>	Children's centres[18] Healthy living centres[6]
Hub and spokes (sometimes referred to as a cluster depending on role of spokes and leadership model)	Hub manager also responsible for spokes sometimes with or without middle managers for each spoke	<ul style="list-style-type: none"> <li>• Formal structure, share operational policies and procedures</li> <li>• Staff might work across spokes</li> <li>• Consistency and fidelity to delivery model</li> <li>• Specialist outreach model</li> </ul>	Children's centres[4] Somerset Team for Early Psychosis [9, 10] Early Psychosis Intervention [11]
Hub provides one stop shop facility and services	Most likely that spokes are managed separately by partnership organisations and services	<ul style="list-style-type: none"> <li>• Spokes provide referral routes to hub</li> <li>• Hub provides training centre</li> <li>• Flexibility – longer opening hours</li> <li>• Can change core components to meet changing needs</li> </ul>	Teenage health services[7] Healthy living centres[6]
Hub provide central specialised care and spokes provide core services	Emphasis is on the network as the managing organisation rather than the individual services	<ul style="list-style-type: none"> <li>• Care providers coordinate core activities in the spokes</li> <li>• Use of web based technology to disseminate expertise and/or administer treatment</li> <li>• Benefit from remote specialists rather than having to be on site.</li> </ul>	Physical health services[3, 17]
Hub is strategic centre with strategic lead	Spokes have separate managers	<ul style="list-style-type: none"> <li>• Spokes are managed independently</li> <li>• Spokes from within same sector and division</li> <li>• Hub responsible for coordination and delivery of data</li> </ul>	Children's centres[4]

Hub provides core leadership. There may be one or two hubs	Spokes are outsourced (multi agency partnership)	<ul style="list-style-type: none"> <li>• Informal clusters</li> <li>• Sharing of extended services</li> <li>• Training</li> <li>• Programme fidelity</li> <li>• Enhancing capacity of voluntary sector</li> </ul>	Children's centres[4] Healthy living centres[6] Mental health services for people with personality disorder[8]
Virtual hub, for example a virtual site might be hosted in a school just to provide an administrative base and address)	Spokes are all outreach in community settings	<ul style="list-style-type: none"> <li>• Low cost</li> <li>• Lack of identity or focal point</li> </ul>	Healthy living centres[6] Children's centres[4]
Networks of services that are joined together sharing the same vision for practice and outcomes but there is no central hub	Management structure provided though network. Likely to have steering group made up of network managers.	<ul style="list-style-type: none"> <li>• Capacity building</li> <li>• Community cohesion</li> <li>• Focus often more about multi agency collaboration than running services and activities</li> </ul>	Health services[3, 15]
Hub acts as emergency or crisis response centre	Spokes are bi-directional to and from the hub and provided by a collaboration of services (likely to be both formal and informal arrangements)	<ul style="list-style-type: none"> <li>• Spokes provide direct access to emergency care</li> <li>• Spokes provide after care and links to community support</li> </ul>	Mental health emergency psychiatric service[12]

## **3. The effectiveness of hub and spoke**

### **3.1 Challenges for this review**

Assessing the impact of hub and spoke service provision is hampered by lack of effectiveness evidence. Many of the evaluations included focus on pilot programs or large-scale initiatives where hub and spoke models have been identified but only moderately appraised as a bi-product of the wider evaluation. This makes it difficult to untangle which successes or challenges can be attributed to the hub and spoke model itself. In addition, while some evaluations are comparative, in others where there are variations of hub and spoke models, it is not always made clear which findings relate to which model, undermining attempts to assess effectiveness.

### **3.2 Effectiveness and cost effectiveness**

Where evidence exists, evaluations of healthcare provide the best data on effectiveness and cost-effectiveness of hub and spoke models of service provision. A number of these papers report on the benefits of hub and spoke models for rural and remote communities, particularly in Australia and North America, suggesting that the model works well to extend geographic reach and improve efficiency. Three key themes emerge that suggest hub and spoke models are more likely to:

- Increase numbers of people accessing and engaging in treatment
- Get patients into treatment faster
- Be more cost effective.

In a comparative study by Cheng *et al.* (2013) on early psychosis intervention services for the rural and remote population of Ontario, Canada, early findings indicated that clients experienced better outcomes when served by the hub and spoke model than those served by specialist outreach provision. A significantly higher number of clients were seen (457 compared to 91 in specialist outreach), functioning in the community was better and there were fewer hospital admissions. The paper concludes that future work needs to be undertaken explore why differences exist and how these findings could influence future service design for rural and remote populations[11].

Another comparative study highlights differences in treatment experiences of oesophageal or gastric cancer patients when comparing the hub (centralised tertiary hospital) with the spoke (local district general hospital). There was a statistically significant increase in the time from diagnosis to the multidisciplinary meeting discussion at the spoke hospital compared to the hub. However, time to first treatment (surgery, palliative therapy or best supportive care) was significantly increased in the hub hospital compared to the spoke. This paper highlights the disparity in the management pathways of patients who first present to a regional hospital rather than the tertiary centre. Patients at the spoke hospital have a longer lead time into the multi- disciplinary meetings but non-operative treatment appears to be delivered more quickly locally through the spokes[13].

This suggests that spokes play a valuable role in providing early help and support while the hub provides a multi-disciplinary team for those requiring urgent responses for complex problems. In this model, the hub provides a specialist service and the spokes provide both rapid referrals to the hub when necessary and lower level support, reducing the likelihood of blocking up the hub with inappropriate referrals. This indicates that hub and spoke models can make the most efficient use of limited resources.

Where studies have examined cost and effectiveness, hub and spoke models have been shown to provide value for money. In a study examining the best methods of delivering oral health care to rural and remote regions in Australia, the authors concluded that a networked hub and spoke approach of five spokes to one hub is significantly more cost efficient than large scale public sector models. While there were additional travel costs associated with this model, these costs were off-set by shedding the substantial fixed cost and administrative overhead cost base of traditional large government sector clinical organisations[13].

The final example of an effectiveness study in healthcare is drawn from a paper on assessing the cost-effectiveness of a telestroke network. This compares the management of acute ischemic stroke from the perspectives of a telestroke network, a hub hospital, and a spoke hospital. Telestroke or telemedicine is the use of electronic communication methods, such as telephone, internet, and videoconferencing to exchange medical information from one geographic site to another. The American study revealed that compared with no network, a telestroke hub and spoke system may increase treatment therapies, the number of stroke patients discharged to home and provide greater cost savings for the entire network, despite setup and maintenance costs[17].

## 4. Factors promoting and hindering the success of models

Understanding the factors that promote or hinder the success of hub and spoke models is hampered by the ways in which data are reported, with few studies focusing on the evaluation of the hub and spoke model itself. Where available, evidence points to a series of contextual factors that both determine design and delivery as well as the success of the model. These cohere around macro level themes such as policy context and commissioning, funding, changes in strategy and leadership, through to operational and service delivery factors down to micro layers regarding service user expectations and experiences. While there is overlap between contextual factors, this provides the framework for identifying what contexts support development of successful hub and spoke models of service provision.

### 4.1 Macro-level contextual factors

#### 4.1.1 Policy and commissioning context

Different agendas have driven development of hub and spoke models in different sectors. In both mental and physical health services, a deliberate choice has been made to set up hub and spoke models of service delivery. This is based on the

premise that hub and spoke models are more effective than current models[9, 19]. On the other hand, children's centres and initiatives for young people have tended to develop more organically over time, responding to changes in funding streams, local agendas and the changing needs of the service user group[4, 5].

#### **4.1.2 Funding**

Funding is a key determinant of service model design and delivery, whether a stipulation of the funding application[8] or the impact of restructuring services due to funding cuts[4]. For example, in response to funding cuts, Children's centres have moved away from a 'single site' within 'pram pushing distance' to networks and cluster models. Funding cuts also affected the types of services on offer with a move from universal provision to services that have a more narrowly targeted and focused approach for the most vulnerable families. Services provided by partners were also reorganising (such as JobCentre Plus) resulting in fewer staff providing specialist services inside centres[4].

#### **4.1.3 Leadership and management**

In addition, some centre leaders were 'promoted' from front-line management of a stand-alone centre to a 'reconfigured' role involving management of a cluster of three or four centres or sites. Such reconfigurations resulted in variation in the leadership and management of centres. Findings from a staff leadership questionnaire on the effectiveness of leadership varied by site with 'main-site setups with single-lead centre managers' rated as highest. Although not statistically robust, the authors suggest that managers of main site centres (with no satellite sites or other regular venues) were reported to provide certain management tasks more effectively, while acknowledging it could also be that these managers are significantly better trained and/or have greater experience[4].

Goff *et al.*'s evaluation of children's centres also considered the impact of restructuring on management accountability and autonomy. Where centres had moved from single site to formal clusters and hub-and-spoke arrangements, managers reported an increased sense of accountability that was not always coupled with increased autonomy. For example, one centre leader felt that the cutbacks experienced in her 'spoke' centres had reduced her role to little more than a site manager, and others referred to the tensions between spending time getting to know parents and travelling to spoke centres. As one service provider commented: 'Children's centre leaders will be less hands on, not so much on the ground level and this is a shame because having a knowledge of the community and local needs is important'[15].

#### **4.1.4 Multi-agency working**

Whilst not exclusively linked to hub and spoke models, children's centres reported a number of challenges linked to multi agency working. These included: different professional values and approaches, such as differences in language between practitioners from different sectors; differences in targets that had to be met; and different thresholds of eligibility for families seeking their services. Sometimes centre managers thought that other services had unrealistic expectations of what centres could offer. Social care, for example, expected centre staff to work with highly

vulnerable families and that social care has unrealistic expectations about what a children's centre can offer. It was also documented that there were frequent disagreements over the thresholds for referral of children or families[4]. While these challenges may have been experienced by single site provision, they may be exacerbated or more acutely felt among multi-agency service clusters than single site models.

## 4.2 Mid-level operational issues

### 4.2.1 Information sharing

Children's Centres working in partnership with health and social care either in clusters or in hub and spoke models rely on accurate data sharing. However, this was commonly reported as problematic. Again, while not necessarily specific to hub and spoke models, staff from children's centres felt that birth data was very important if children's centres were to provide effective and responsive services but health partners were reluctant to share this data and adequate protocols were not in place to manage this[4].

Difficulties around sharing information also impacted on development of the hub and spoke service developed by the Somerset team for Early Intervention. It was initially envisaged that the spoke teams would be sited in non-statutory youth agencies, but the need to access healthcare system meant that spoke workers were located in existing mental health teams in order to access Healthcare Trust data systems[9].

Considerations of how the bi-directional flow of information and data sharing between hub and spokes is a critical element of service design. In addition, where hub and spoke services had developed as clusters, cluster leaders are more likely to engage with a wider range of data from a broader spectrum of settings than single site managers, including information on regional and national trends to inform their work. This requires additional data management and analysis skills than needed in more traditional forms of service provision[20].

### 4.2.1 Extending capacity and reach

Extending the capacity and reach of services, is identified as a key operational benefit of hub and spoke models. This appears to be particularly successful where the service has been deliberately set up as hub and spoke provision. In the evaluation of STEP, Burbach suggests that the model provides both a specialist service while facilitating strong links with mental health colleagues, primary care and other local services/agencies. This ensures that the service is embedded within local service provision while extending its geographical reach to patients for whom a centralised service is inaccessible:

The EI service structure has enabled a strong focus on psychosocial interventions and countywide structures for support and supervision have helped our team retain focus and prevent burnout. Unlike generic models of EI work, our 'hub-and-spoke' structure has enabled team members to hone specialized skills and not be diverted into working with other client groups[7].

In addition, the evaluation highlighted anecdotal evidence from commissioners who commented positively on how well the model worked locally, providing support to a much larger geographic area, where there was insufficient numbers of patients to warrant direct specialist work but where there was still critical need[6].

However, a combination of contextual pressures can impact on the delivery of hub and spokes in rural and remote communities. Cheng *et al.*'s comparative evaluation of EPI programmes in Ontario, Canada documented a move from hub and spoke provision to specialist outreach services, despite positive evaluation of the model. The reason for the shift included isolation for providers, difficulty adhering to EPI guidelines for the workers located in satellite sites, and the pull to provide non-psychosis-related mental health care due to enormous demand for generalist mental health services. In addition, one service renamed their model from hub and spoke to the network model. This was done to de-emphasize the perceived hierarchy suggested by the name of hub and spoke. Whereas the operation of a network approach was considered to ensure a more equal partnership between service providers in the region[11].

#### **4.2.2 Identity and public profile**

Networks, while providing providers with an increased sense of partnership, may encounter difficulties with their public profile. The evaluation of HLCs identified the economic benefits of operating as a network without the overheads of a physical building. However, the most frequently cited disadvantage was lack of public profile and identity[6]. Where services operated from a building, this hub was often seen as an important community focal point. In the evaluation of centres of early excellence, the forerunners of Surestart, new or newly refurbished buildings are considered a major resource in isolated or deprived areas, acting as one-stop-shop and bringing many services under one roof for the local area as well as providing a base for community outreach work[4].

### **4.3 Micro-level individual factors**

#### **4.3.1 Changing service user perceptions and patterns of service use**

Service user expectations also determine the success of hub and spoke models. The evaluation of THDS shows how a change in service direction can impact on the take up of services. Despite now offering a more holistic range of services, in both the Hackney and Bolton THDS that adopt a hub and spoke model, young people's perceptions and use of services remains predominantly focused on sexual and reproductive health. The authors conclude changing service user perceptions and patterns of service use takes time and that running services that achieve sustained use by young people is highly skilled, specialist work[7].

#### **4.3.2 Service acceptability and accessibility**

The acceptability and accessibility of services also determine take up of services. In her evaluation of THDS, Austerberry *et al.* (2008) reflect on the advantages and disadvantages of different models of hub and spoke provisions for young people. She suggests that while a central hub is an efficient way of bringing together a wide

range of services and operating flexible opening hours, it is unsuitable in areas where young people are unwilling or unable to travel to a centralised resource.

For example, having a large hub as the focus of the service is not a suitable model in areas where transport links are poor or in outlying rural areas. Even in cities where transport links are adequate, the reluctance of young people to travel far in order to access services was widely commented on by staff (referred to by some staff in Hackney as ‘the postcode factor’). This means that the spoke components are critical and the potential risk that a large hub could swallow up a disproportionate amount of available resources is one that requires careful management[5].

Acceptability and accessibility are also features of the study exploring development of Early Years Centre initiatives in Queensland, Australia. Here, the ability to access the service via ‘soft entry’ points such as drop-ins, toy libraries, playgroups, and cooking classes are highly valued by parents as they are perceived as low-risk, low-threshold, flexible and adaptable. They are considered non-stigmatising doors to more targeted services[18].

## **5. The perspectives of people who use services and their carers**

The evaluations included in this review contain almost no information on service user and carer views. The evaluation of children’s centres did include a strand on family experiences but on further examination, the feedback was not specifically linked to hub and spoke models and hence not included for review[21]. In the papers where a direct link is made between user views and hub and models, it is in relation to service user involvement in the design and delivery of hub and spoke services.

### **5.1 Service User involvement**

The South Yorkshire Connexions pilot adopted a ‘hub and spoke’ model for involving young people in the design and delivery of services. There were two basic levels of involvement. At the centre or hub, young people were concerned with the overall nature of the service e.g. helping to define objectives, quality standards, recruitment procedures and data-sharing protocols etc. This may be via their involvement on strategic boards or local management committees, on shadow forums or through existing institutions such as Youth Parliaments. Young people’s analysis may also be based on methods such as focus-group meetings and surveys of young people[22].

Outside the hub, there is further consultation on particular services. For example, young people would be involved in informing the design and delivery of particular Connexions services e.g. to Black and minority ethnic young people. Young people may sit on task or strand management groups or shadow forums, participate in focus groups and develop feedback mechanisms to Personal Advisers.

At the point that this was documented by Dickinson *et al*, this model was still in its development stage so issues about how the involvement at the spokes relate to involvement at the hub were still being worked through[22]. However, it does ask questions about how service users influence the design and delivery of services.

## **5.2 Hub and spoke development as a result of service user views.**

A paper looking at services for carriers of the gene mutation BRCA1 and BRCA2, report how a hub and spoke model of support was proposed as a result of service users views. The ability to “dip in and out” on an ad-hoc basis reflects changing needs over time, influenced by certain triggers—different people want different things at different stages in their life and throughout their genetic journey[14]. It was proposed that a hub and spoke model with core services at the centre would offer a range of support through the spokes, such as support groups, web forums and health information.

## **5.3 Sustaining service user participation**

One of the challenges identified by the THDS was the sustainability of and broadening the reach and impact of participation work by young people. The difficulties were overcome, to some extent, by commissioning a local specialist agency to support the work around participation and a plan was in place to joint fund and recruit a specialist youth participation worker to take this work forward[7].

# **6. Conclusions and recommendations**

With the availability of relevant literature being so limited, we opted to widen our searches to include additional service user groups and sectors. While highlighting a gap of evaluations into the effectiveness of the hub and spoke model, it did enable the review to look beyond support services for young people to explore both adult mental health and more general healthcare fields, which has provided some valuable data and potential learning around this delivery model.

One thing that is evident from the literature is that what constitutes a hub and spoke model varies greatly both across sectors and within sectors. For each sector represented in this review there is evidence that the model of the ‘one stop shop’ and single site centres are being replaced with multiple site delivery, sometimes with complex leadership and operational arrangements. The evaluation of children’s centres in the UK provides some of the richest data around this, illuminating the complex nature of service delivery across multiple sites. There are numerous examples suggesting that hub and spokes, satellites, clusters and networks are being blended together to develop sophisticated and multifaceted approaches to ensure services make the best attempts possible to extend reach, be cost effective and demonstrate efficiency.

We have also found that some evaluations are better than others at identifying the impact of the delivery model on effectiveness and outcomes. It seems that health care services are marginally better at comparing and examining the hub and spoke model than other sectors, but even these are limited in terms of their analysis and attempts to evaluate the impact of the contextual layers on service success.

Service user views and perspectives are also largely absent from evaluations featuring hub and spoke models, highlighting a gap and opportunity for researchers.

Where evaluations have included the voice of the service user, it is almost impossible to distil whether the experience is related to the use of a hub and spoke model, with the majority of evaluations failing to distinguish between models when examining data and feedback.

Despite the limitations identified, there are some themes emerging around factors that promote and hinder success of a hub and spoke model. These cohere around macro level themes such as policy context and commissioning, funding, changes in strategy and leadership and operational delivery factors down to micro layers regarding service user expectations and experiences. By drawing on these emerging themes, some recommendations for existing and future models of hub and spoke delivery are offered as followed:

- Changes and cuts to funding can adversely affect the continuity and consistency in the role of the hub and the spokes. Contingency planning around different management structures and operational procedures may help reduce the impact on vulnerable service users requiring specialist support.
- Formalise systems for managing data and information sharing between the hub and spokes. Consider the bi-directional flow of information, the practical issues of accessing databases and the cultural diversity of multi-agency working. Ensure procedures for information sharing are underpinned by policy.
- The hub and spoke model appears to adapt well to services attempting to extend reach across marginalised groups as well as geographical areas. Be mindful of spokes feeling isolated and/or excluded from the central hub and build in support structures for workers.
- The telestroke service provides a valuable insight into the role that technology can play in sharing expertise and specialist knowledge remotely between hub and spokes. Think about the role of technology such as videoconferencing to access expert advice (as well as support) in the spokes.
- In hub and spoke models using multi-agency collaborations, consider the impact on voluntary and community sector identities and profiles. Consider how the hub may overshadow the spokes identity for example as a specialist charity. Build in early discussions about branding, publicity and the profiles of the hub and spokes.
- Embed service user participation into the design, delivery and monitoring of services. Be creative but realistic about how and when service user involvement will be most effective to ensure it is meaningful. Explore partnering with an external agency with a track record of expertise in this field.

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## Appendix A: Search strategy

### Methods

The methods used to identify and organise material in this research review were developed by the Social Care Institute for Excellence (SCIE)[2]. These involved identifying a clear research question, undertaking systematic and reproducible searches of the key evidence sources and identifying relevant research studies for review. Due to time and budget constraints, no systematic attempt has been made to assess the quality of evidence.

Searches were conducted between June and July 2014.

### Review question

The research review addresses aims to identify and describe:

5. different models of models of hub and spoke service provision, including context and characteristics;
6. evidence of their effectiveness, with focus on outcomes achieved;
7. factors promoting and hindering the success of these models;
8. the perspectives of people who use services and their carers.

### Search strategy

Consultation with the project team identified this as an area where practice was likely to be ahead of the research. This meant undertaking searches on topics beyond CSE to capture learning from the wider literature on the effective approaches to hub and spoke service provision. In agreement with the commissioners of the review, initial topics included: children's services including children's centres, targeted youth services, drug and alcohol services, sexual health services and disability services.

These topics were identified both because of direct relevance to CSE e.g. children's services and sexual health services but also recommendations to search for hub and spoke models in the area of disability. However, initial searches revealed a more limited number of evaluations than anticipated. Following discussion, a second phase of searches were undertaken to identify evaluations of mental health and physical health services more generally. It was also agreed to expand searches to locations beyond the UK.

#### *Where the material was found*

Bibliographic databases: ASSIA, Discover, Google, Google Scholar, NHS Evidence, PsycInfo, Scopus and Social Care Online.

Existing database created by the reviewer: CSE awareness raising

Expert recommendations: Supplied by Julie Harris.

Academic and organisational websites: Barnardos, NSPCC Inform.

#### *Database keywords*

The diverse focus of studies for the current involved different search terms depending on the topic. Keywords included:

Children's services: hub and spoke, cluster\*, network\*, satellite\*, outreach, children's services, children's centres, social care, outcomes and evaluation.

Targeted youth services: hub and spoke, cluster\*, network\*, satellite\*, leaving care teams, looked after children, targeted youth support, connexions, youth offending teams and evaluat\*.

Drug and alcohol services: hub and spoke, cluster\*, network\*, satellite\*, drug and alcohol service\*, substance misuse service\*, young people and evaluat\*.

Disability services: hub and spoke, cluster\*, network\*, satellite\*, disability service\*, young people and evaluat\*.

Sexual health services: hub and spoke, cluster\*, network\*, satellite\*, disability service\*, sexual health service\*, young people and evaluat\*.

Mental health: hub and spoke, cluster\*, network\*, satellite\*, mental health service\*, CAMHS, young people and evaluat\*.

Physical health services: hub and spoke, cluster\*, network\*, satellite\*, health\*; healthy living centres and evalut\*.

#### *Eligibility criteria*

In order to be included for full review, items had to be from an evaluation study. Studies reporting the views of children, young people, parents/carers were also included. This reflects the aims of the review to understand the perspectives of people using hub and spoke services; evidence unlikely to be identified via a focus on evaluation studies only. Research types included university research reports, independent and voluntary sector reports and peer reviewed journal articles. English language, international studies were included. Only items after 2003 were included. This date was chosen to capture changes in children's services following introduction of the Government initiative in England and Wales, *Every Change Matters*[23].

#### *Data management*

All references identified from the searches are stored on EndnoteTM Bibliographic software. Almost all items have a document or weblink.

#### *Screening*

All abstracts were screened against inclusion criteria, see end of appendix for completed inclusion/exclusion template. Items were double screened to ensure reviewer consistency with a high level of agreement identified.

#### *Items included for review*

In total, 48 items were identified, including four duplicates. **20** items were included for final review. The majority (12) are research reports[3-6, 8, 10, 16, 18-20, 22, 24] with eight items identified as journal articles[9, 11-15, 17, 25]. Two of these papers are linked to the same study on early intervention service for psychosis[9, 10].

*Source of includes*

The majority (20) of includes were identified via databases searches: Google scholar (8); DISCOVER (5); NHS Evidence (2); PsycInfo (2); and Google (1) with two identified from expert recommendation.

## Inclusion / exclusion criteria template<sup>1</sup>



Inclusion / exclusion criteria		Guidance	Comments and queries
1	<b>EXCLUDE Date of publication before</b>	2003	Except relevant EEC paper published in 2002
2	<b>EXCLUDE language e.g. not English</b>	Not English	
3	<b>EXCLUDE Publication type e.g. not journal or research report</b>	Exclude books, dissertation abstracts, trade magazines (e.g. Community Care), policy and guidance?	Include policy and guidance if it relates to CSE and hub and spoke provision
4	<b>EXCLUDE Location e.g. not UK</b>	International papers	Include international literature with particular interest in Australia and New Zealand
5	<b>EXCLUDE Population e.g. not young people</b>	All populations type	
6	<b>EXCLUDE Scope</b>	Not about hub and spoke models of service provision	Include studies about effectiveness.  Include service user, carer and practitioner perspectives.
7	<b>EXCLUDE: Research type</b>	Not academic research report, peer review or voluntary sector evaluation report	Include research and voluntary sector evaluations Include literature reviews

<sup>1</sup> This is based on the Social Care Institute for Excellence (SCIE's) inclusion/exclusion criteria template.

8	<b>EXCLUDE:</b> <b>insufficient details</b> to identify reference or no abstract to screen		
9	<b>QUERY</b>		Not sure if able to include, query with JH
10	<b>INCLUDE</b>		

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