

Swedish Child Health Services Register: a quality register for child health services and children's well-being

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ABSTRACT

Background Swedish child health services (CHS) is a free-of-charge healthcare system that reaches almost all children under the age of 6. The aim for the CHS is to improve children's physical, psychological and social health by promoting health and development, preventing illness and detecting emerging problems early in the child's life. The services are defined in a national programme divided into three parts: universal interventions, targeted interventions and indicated interventions.

The Swedish Child Health Services Register (BHVQ) is a national Quality Register developed in 2013. The register extracts data from the child's health record and automatically presents current data in real time. At present, the register includes 21 variables.

Aim We aim to describe data available in the BHVQ and the completeness of data in BHVQ across variables.

Methods Child-specific data were exported from the register, and data for children born in the regions were retrieved from Statistics Sweden to calculate coverage.

Results The register includes over 110 000 children born between 2011 and 2022 from 221 child healthcare centres in eight of Sweden's 21 regions. In seven of the eight regions, 100% of centres report data.

The completeness of data differs between participating regions and birth cohorts. The average coverage for children born in 2021 is 71%.

Conclusions The BHVQ is a valuable resource for evaluating Child Health Services nationally, with high coverage for the youngest children. As a result of continuous improvement of the services, the possibility to follow the development of children's health in Sweden is possible through the register. When fully expanded, the register will be a natural and essential part of developing preventive services, improving healthcare for children below 6 years of age and a tool for developing evidence-based child health interventions.

INTRODUCTION

Child health services (CHS) in Sweden are free-of-charge and a nationwide healthcare system for children living in Sweden under the age of 6. This covers approximately 710 000 children. The CHS has high credibility in

WHAT IS KNOWN ABOUT THE SUBJECT?

- ⇒ Swedish child health service aim is to improve children's physical, psychological and social health by promoting health and development.
- ⇒ The services are defined in a national programme divided into three parts: universal interventions, targeted interventions and indicated interventions.
- ⇒ Almost all children in Sweden attend regular visits in the child health services.

WHAT THIS STUDY ADDS?

- ⇒ The Swedish Child Health Services Register has a high coverage among the youngest children in the eight participating regions.
- ⇒ The register contains data on over 110 000 children; in seven of the eight regions, 100% of centres report data.
- ⇒ The data in the child health services records are automatically exported to the Swedish Child Health Services Register.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

- ⇒ The Swedish Child Health Services Register is a valuable resource for evaluating methods in used in the Child Health Services.
- ⇒ Data in the register can be a valuable resource for research regarding children's health.
- ⇒ By using personal identification number in the register, it is possible to link data between registries.

the Swedish community, and almost all children attend at least one regular visit to CHS.¹ The CHS aims to improve children's physical, psychological and social health by promoting health and development, preventing illness and detecting emerging problems in the child's environment. In the CHS, children and families receive preventive healthcare such as vaccinations, parental support and healthy lifestyle promotion. Regular check-ups regarding psychomotor and language development, growth monitoring and vision and hearing screenings are



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carried out. The services are defined in a national CHS programme divided into three parts: universal interventions, targeted interventions and indicated interventions.² Foremost, the programme is delivered by a registered specialist nurse in primary or paediatric care. The universal part consists of 15–16 health visits, of which 11–12 visits are during the child's first 12 months. Four team visits with a nurse and a physician, according to the programme, are also included. All the interventions in the programme are based on principles of proportionate universalism. They should be adjusted to the needs of every family^{3 4}; thus, the programme can lead to more than 16 visits. The programme is based on the United Nations' Convention on the Rights of the Child.⁵ The CHS have a unique opportunity to intervene early when staff are concerned about a child's well-being.⁶

Child health records and regional child health units

Electronic health records (EHR) have been implemented in the CHS in 20 out of 21 Swedish regions, and the records are well structured, with some regional differences.

In most regions, the staff receive supervision, training, consultation and support in implementing new methods and improvement work from a regional CHS unit, most often consisting of a nurse, a physician and a psychologist. The Swedish CHS has a long tradition of data-driven quality improvement and evaluation processes in which the regional CHS units have a major role. Traditionally, the evaluation of the CHS has been performed through regional annual reports of statistics shared with the CHS providers in dialogue meetings. The statistics have been manually reported by each clinic or extracted from the respective data journal system—often a combination of these methods, thereby these reports have already been outdated when presented due to time lag.

The Swedish Child Health Services Register

Based on the need for a national structure for collection of statistical data for quality improvement, the Swedish Child Health Services Register (BHVQ) was the result of an interprofessional national effort to define quality indicators for preventive child healthcare. In 2013, financial support was granted by the Swedish Association of Local Authorities and Regions and a formal board was formed.

BHVQ aims to improve the quality of the care offered within CHS and, as a result, follow the health status of children. Most measurements chosen are healthcare indicators and determinants for children's long-term health. BHVQ makes it possible to measure health access and outcomes from the CHS programme in both short-term and long-term time horizons.⁷ In the Swedish national system for knowledge-driven management,⁸ BHVQ's role is to evaluate and deliver data to enable monitoring the national programme nationwide. This facilitates the national system for knowledge-driven management to suggest adding or subtracting indicators in the CHS and BHVQ.

Furthermore, BHVQ is today managed by a register holder and a board of members from different regions in Sweden, including all professions participating in the CHS. Half of the board members have a relevant PhD, and all have a long experience working in the CHS.

Regulations and prospects

Sweden has a long history of using and combining data from different registries for scientific purposes.⁹ It is considered a part of the national structure of research and healthcare.¹⁰ The personal identification number (PIN) is recommended to be used as a base for all registries in Sweden,¹¹ which allows data to be combined with other registers and thereafter pseudonymised. The use of PINs and personal data is controlled by regulations regarding the General Data Protection Regulation and Swedish national laws.¹² Data usage inside national quality registries is regulated in the Swedish patient data act.¹³ For national quality registries, the legislation makes it possible to collect data about patients and patient care with the obligation to inform patients of data collection for a register. The patient can request not to be included in the register and erase data.¹³

Aim

We aim to describe:

1. Data available in the BHVQ.
2. Completeness of data in BHVQ across variables.

METHODS

For this study, child-specific data were exported from the register's internal Microsoft Power BI Self-Service portal. Microsoft Power BI calculations were conducted with data extraction from the BHVQ database and analysed and summarised in Microsoft Excel (V.2022). Data for children born in each region were retrieved from Statistics Sweden.

Variables in the register

BHVQ includes 21 variables, for example, home visits, screening for maternal mental health, growth, language screening and exposure to secondhand smoking, of which most are collected continuously at the visits in the CHS. See online supplemental appendix 1 for a complete list of variables.

Home visits

Two home visits are included in the CHS programme. The first visit is conducted during the first 30 days after birth, and the second around 8 months post-partum.¹⁴ Home visits can promote childhood development, identify risk factors and improve parenting skills.¹⁵ BHVQ enables regions to follow the frequency of home visits, allowing for resource allocation. Several projects are ongoing regarding extended home visiting programmes in Sweden.^{15–17} The data structure for the home visits in the BHVQ can be used for collecting data on additional home visits.

Parental mental health problems

In BHVQ, participating in the Edinburgh Postnatal Depression Screening¹⁸ is observed for every child's mother and reported as a bivariate variable (Have/have not received Edinburgh Postnatal Depression Screening). In most regions, one visit for the non-birth-giving parent is implemented and followed in the BHVQ.

Growth

The register monitors all measures on length, height and weight in children at all visits conducted at the CHS.¹⁹ Body mass index is calculated and presented at three ages: two and a half, four and five.²⁰ Since the register follows individual data, further analysis of trajectories is possible.

Language screening

The CHS programme includes a language screening at 2.5 or 3 years of age. There are two methods available, and BHVQ provides data usage of both methods.^{21 22}

Patient-reported measurements

Patient-reported outcome measures are used in BHVQ regarding exposure to secondhand tobacco smoke and the child's breast milk intake or breast feeding, which both are strongly associated with child health outcomes.^{23–26}

Data collection and storage

The child health records, administrated by the CHS, are the data sources for the register with the child's PIN as the primary key. Data are automatically exported to the register's server via a national service-contract platform or point-to-point. As new information is added to the child's health record, the register is updated. Furthermore, the data are stored on a web platform in a Structured Query Language-Server.

To provide feedback to participating regions, centres and nurses, variables are published online in aggregated form in an interactive report with the possibility of combining data. This enables professionals and decision-makers to follow the quality and production of services in the CHS. A two-step authorisation provides access to detailed data in a specific region.

Validation of data

To study the validity of the data in the register, a comparison is made with data in the child's health record in all regions delivering data to the BHVQ, which is audited annually. All variables and their specific values are audited in a specific age category. Age categories 0–12 months, 1–2 years and 3–5 years are used. All variables and values are thereby audited within 3 years.

Ethical issues and data available for research

All caregivers who visit the CHS with their child receive information that data from the child's health record are exported to BHVQ, with the possibility to opt out at any time in accordance with current legislation.¹³

Table 1 Number of children in BHVQ and proportion of all children in Sweden according to Statistics Sweden (31 December 2021)

| Birth cohort | Total amount of children in the BHVQ N | Percentage of children in Sweden in BHVQ |
|--------------|--|--|
| 2011 | 73 | 0 |
| 2012 | 530 | 0 |
| 2013 | 1335 | 1 |
| 2014 | 3623 | 3 |
| 2015 | 4984 | 4 |
| 2016 | 6785 | 5 |
| 2017 | 14 713 | 12 |
| 2018 | 15 471 | 13 |
| 2019 | 14 906 | 13 |
| 2020 | 16 701 | 15 |
| 2021 | 17 810 | 16 |
| 2022 | 14 206 | No denominator available for this birth cohort |
| Total | 111 137 | |

BHVQ, The Swedish Child Health Services Register.

After approval from an ethical review board, researchers may obtain pseudonymised data from BHVQ to link to other national and quality registers. This enables following children over time or analysing a single birth cohort.

RESULTS

Population

The register aims to include children in Sweden aged 0–5 who have attended CHS and whose caregivers have not opted-out of participation. In January 2023, the register contained data from over 110 000 children born between 2011 and 2022 from participating regions (table 1).

Participating regions

Eight regions in Sweden deliver data from 221 CHS centres. Since 2017, when the region of Dalarna started to deliver data, there have been continuous data transfer projects in several other regions. Hence, the number of children with data in the BHVQ differs between birth cohorts and regions (table 2). In total, 100% of the CHS centres in seven of the eight regions deliver data to the BHVQ.

Coverage

The completeness of data is compared with data from Statistics Sweden on children born in each region to calculate the coverage (table 2). The completeness of data differs between regions and birth cohorts. The average coverage for children born in 2021 in participating

**Table 2** Coverage per region in Sweden

| Region in Sweden | Start | | Children living in the region N | Children in the BHVQ N (%) |
|------------------|--|--------------|---------------------------------|----------------------------|
| | Year and month for delivering data to BHVQ | Birth cohort | | |
| Dalarna | September 2017 | 2021 | 2816 | 2 840 (100) |
| | | 2020 | 2965 | 3 026 (100) |
| | | 2019 | 3059 | 2 963 (97) |
| | | 2018 | 3195 | 2 946 (92) |
| | | 2017 | 3279 | 2 824 (86) |
| Gotland | September 2022 | 2021 | 532 | 562 (100) |
| | | 2020 | 496 | 500 (100) |
| | | 2019 | 566 | 548 (97) |
| | | 2018 | 585 | 563 (96) |
| | | 2017 | 637 | 620 (97) |
| Gävleborg | December 2021 | 2021 | 2770 | 1 890 (68) |
| | | 2020 | 2815 | 760 (27) |
| | | 2019 | 2986 | 439 (15) |
| | | 2018 | 3276 | 531 (16) |
| | | 2017 | 3099 | 603 (19) |
| Jönköping | March 2019 | 2021 | 4054 | 2 514 (62) |
| | | 2020 | 4288 | 3 757 (88) |
| | | 2019 | 4274 | 4 020 (94) |
| | | 2018 | 4416 | 3 843 (87) |
| | | 2017 | 4341 | 3 147 (72) |
| Kronoberg | October 2022 | 2021 | 2275 | 1 949 (86) |
| | | 2020 | 2402 | 1 878 (78) |
| | | 2019 | 2412 | 1 821 (75) |
| | | 2018 | 2370 | 1 844 (78) |
| | | 2017 | 2398 | 1856 (77) |
| Stockholm | November 2022 | 2021 | 28 880 | 2 905 (10) |
| | | 2020 | 28 288 | 1 805 (6) |
| | | 2019 | 28 352 | 2 164 (8) |
| | | 2018 | 28 522 | 2 470 (9) |
| | | 2017 | 28 968 | 2 466 (9) |
| Södermanland | October 2020 | 2021 | 3113 | 3 035 (97) |
| | | 2020 | 3258 | 3 143 (96) |
| | | 2019 | 3344 | 2 719 (81) |
| | | 2018 | 3593 | 2 777 (77) |
| | | 2017 | 3739 | 2 870 (77) |
| Västernorrland | October 2022 | 2021 | 2393 | 2 178 (91) |
| | | 2020 | 2325 | 1 892 (81) |
| | | 2019 | 2531 | 293 (12) |
| | | 2018 | 2658 | 545 (21) |
| | | 2017 | 2585 | 383 (15) |

The number of children in each region based on data from Statistics Sweden (31 December 2021) compared with the number of children in the BHVQ per birth cohort. In Stockholm, only one healthcare provider delivers data. In 2023, remaining providers expect to start delivering data. BHVQ, The Swedish Child Health Services Register.

regions is 71%. Since the children must attend the CHS to be included in the register (information obligatory), a relatively higher proportion of the youngest children are included in the register (table 2). Children in the BHVQ include those who have had at least one visit to a specific centre in the region at least once. Families have the right to choose to have their child's healthcare provided in a different region than the one in which they live. Consequently, a total regional coverage does not indicate that all children living in the region have attended a visit in that specific region.

Registry data

The registry contains data from visits in the CHS, home visits and health outcomes. Table 3 shows some of the most requested data available in the register. Both data on attended home visits, screenings and health outcomes of these can be exported from the register. Data are reported aggregated, but individual data are available for research. In online supplemental appendix 2, number of children with visits per year and specific age is reported.

DISCUSSION

BHVQ, as part of the local data-driven quality improvement in the CHS

BHVQ allows the CHS to follow and monitor the CHS programme at every clinic. It also enables an automatic collection of data and a data-driven workflow for the CHS. Through the BHVQ, regions can monitor their data continuously, avoid annual reports with outdated data and compare data nationally. Before BHVQ, annual reports were aggregated regionally with less relevant data for each clinic and could be perceived as criticism and, therefore, tended to be less of a motivation.^{27–29} It could also mean that there was a risk of receiving feedback far too late on negative trends due to outdated data for organisational changes. Using the BHVQ, deviations and variations in the service can be detected early, and relevant interventions can be implemented. The BHVQ provides data to enable data-driven continuous quality improvement within the CHS. With the ability to use the PIN for individuals included in the BHVQ, it is possible to link data to other data sources; moreover, it enables the evaluation of preventive services and their long-term effects. BHVQ can be a tool and a reference for following universal and targeted interventions in the CHS programme.

Several methods used in the CHS programme have limited evidence and are criticised.^{30–32} Using BHVQ methods can be evaluated and gain validity or be discarded from the national CHS programme. BHVQ can therefore be used to develop and evaluate future methods.

Ethical considerations

Data on healthcare utilisation and health are sensitive and must be secured. In the BHVQ, the PIN is used as

Table 3 Results of activities and measurements in the CHS that are exported to the BHVQ

| Birth cohort | Received home visits | Received EPDS | Children who got breast milk at 4 months of age | Exposure to secondhand smoke at 8 months of age; mother smokes | Exposure to secondhand smoke at 8 months of age; father smokes | Negative | | | Obesity | | | | | | | | | | |
|--------------|----------------------|---------------|---|--|--|--|--|---|----------------------------------|-----------------------------------|-------------------------------|---|----|---|--|--|--|--|--|
| | | | | | | Positive on language screening at 2.5–3 years of age | Completed language screening at 2.5–3 years of age | No completed language screening at 2.5–3 years of age | Overweight at 2.5–3 years of age | Underweight at 2.5–3 years of age | Obesity at 2.5–3 years of age | | | | | | | | |
| 2011 | | | | | | | | | | | | | | | | | | | |
| 2012 | | | | | | 20 | 80 | 16 | 1 | 14 | 3 | 6 | 13 | 5 | | | | | |
| 2013 | | | | | | 17 | 83 | 3 | 1 | 21 | 1 | 5 | 13 | 4 | | | | | |
| 2014 | | | | 3,9 | 7,1 | 15 | 85 | 6 | 2 | 18 | 1 | 4 | 12 | 4 | | | | | |
| 2015 | 55 | 59 | 72 | 5,2 | 8,5 | 16 | 84 | 32 | 2 | 17 | 2 | 3 | 10 | 3 | | | | | |
| 2016 | 70 | 65 | 70 | 6,2 | 8,4 | 14 | 88 | 11 | 2 | 16 | 2 | 3 | 11 | 3 | | | | | |
| 2017 | 75 | 70 | 71 | 3,4 | 6,5 | 12 | 90 | 26 | 2 | 18 | 2 | 4 | 12 | 2 | | | | | |
| 2018 | 72 | 51 | 72 | 3,9 | 7,2 | 12 | 88 | 20 | 2 | 17 | 2 | 4 | 10 | 2 | | | | | |
| 2019 | 78 | 64 | 71 | 3,6 | 7,5 | 13 | 87 | 11 | 2 | 14 | 2 | 3 | 10 | 2 | | | | | |
| 2020 | 63 | 79 | 72 | 2,9 | 6,2 | 16 | 85 | 6 | 1 | 12 | 1 | 2 | 10 | 2 | | | | | |
| 2021 | 74 | 76 | 69 | 2,7 | 5,4 | | | | | | | | | | | | | | |
| 2022 | 79 | 73 | 71 | 1,6 | 3,7 | | | | | | | | | | | | | | |

In percentages.
 BHVQ, The Swedish Child Health Services Register; CHS, child health services; EPDS, Edinburgh Postnatal Depression Screening.



a key; however, when data are exported for research, it must be deidentified or pseudo-anonymised. In register research, data shall be handled with discretion. If the data set contains a large amount of data, the possibility to recognise an individual is minimised. All reporting should be aggregated to avoid the possibility of identifying an individual.

Strengths and limitations

This study is based on data available in the register. Compared nationally, the coverage in the register is low, but from a regional perspective, most younger cohorts have almost complete coverage. Several regions have ongoing projects to deliver data to the BHVQ, and the coverage for every new birth cohort is increasing. Continuous improvements and data validation create opportunities for the register to increase coverage and widen its usage. The difference in coverage between regions that send data to the BHVQ depends on several factors. All guardians must be informed about the BHVQ before data are transferred to the register. During the child's first year of life, the visits to CHS are more frequent, followed by annual visits. The time delay can be a year or more if the nurse fails to inform the parents about data export to the register. Also, the regional context affects coverage; for example, when EHRs were implemented.

One limitation of this study is that data regarding the quality of CHS and children's health are not analysed. Further studies are needed to evaluate the CHS and give further recommendations regarding changes in the national CHS programme.

Limitations in the documentation and inconsistent documentation are major challenges for the register, together with several active EHR systems in Sweden. Variations in documentation between regions affect the quality of data. For example, the variable regarding exposure to secondhand smoke differs between regions, where some regions report dichotomous variables, and others only document the presence of exposure. The development of the BHVQ must, therefore, be flexible to include as much data as possible and secure a high-quality level.

CONCLUSIONS

This brief description of the data available in BHVQ shows that the BHVQ is a valuable resource for evaluating CHS at a national level. The completeness of data varies between regions and variables and is increasing as more regions deliver data.

As a result of continuous improvement of the services, the possibility to follow the development of children's health in Sweden is possible through BHVQ. When fully expanded, the register will be a natural and essential part of developing preventive services, improving healthcare for children below 6 years of age, and a tool for developing evidence-based child health interventions.

Accessing the data online allows decision-makers and healthcare workers to follow and analyse the CHS programme's outcomes easily. The ambition of the register is that the online platform facilitates resource allocation and improvements to the population's needs as a data-driven method.

The authors strongly recommend expanding and improving the BHVQ to promote children's health and develop evidence-based child healthcare.

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REFERENCES

- Wallby T, Hjern A. Child health care uptake among low-income and immigrant families in a Swedish County. *Acta Paediatr* 2011;100:1495–503.
- Reuter A. Barnhälsovårdens nationella program. 2018. Available: <https://www.rikshandboken-bhv.se/metoder--riktlinjer/barnhalsovardens-nationella-program/>
- Nygren US, Sandberg H, Tindberg Y, et al. Perceived needs for team-based visits in Swedish child healthcare services exceed its existence—A mixed-methods study targeting healthcare professionals. *Acta Paediatr* 2022;111:653–66.
- Socialstyrelsen. Vägledning för barnhälsovården; 2014. Available: <https://www.socialstyrelsen.se/globalassets/sharepoint-dokument/artikelkatalog/vagledning/2014-4-5.pdf>
- UNG Assembly. Convention on the rights of the child. United Nations, Treaty Series; 1989.
- Västra Götalandsregionen. *Årsrapport barnhälsovård i Västra Götaland*. Central Barnhälsovård Västra Götaland, 2018.
- Socialstyrelsen. Vägledning för barnhälsovården; 2014. 172.
- Sveriges Kommuner och Regioner. National system for knowledge-driven management within Swedish healthcare. Available: <https://kunskapsstyrningvard.se/kunskapsstyrningvard/omkunskapsstyrning/nationalsystemforknowledgedrivenmanagemenentwithinswedishhealthcare.56857.html> [Accessed 3 Jan 2023].
- Rosén ME. Dataregister i vården en kollektiv nyttighet. *Läkartidningen* 1999;96:6.
- Laugesen K, Ludvigsson JF, Schmidt M, et al. Nordic health registry-based research: a review of health care systems and key registries. *Clin Epidemiol* 2021;13:533–54.
- Ludvigsson JF, Otterblad-Olausson P, Pettersson BU, et al. The Swedish personal identity number: possibilities and pitfalls in healthcare and medical research. *Eur J Epidemiol* 2009;24:659–67.
- Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (general data protection regulation). *Official Journal of the European Union* 2016;59.
- Sweden's Riksdag. Patientdatalag (2008:355). Socialdepartementet, (ed.), Svensk Författningssamling (SFS);
- Lindfors A, Hembesök A-TG. Rikshandboken för barnhälsovård. 2021. Available: <https://www.rikshandboken-bhv.se/metoder--riktlinjer/hembesok/>
- Barboza M, Kulane A, Burström B, et al. A better start for health equity? qualitative content analysis of implementation of extended postnatal home visiting in a disadvantaged area in Sweden. *Int J Equity Health* 2018;17:42:42.
- Barboza M, Marttila A, Burström B, et al. Towards health equity: core components of an extended home visiting intervention in disadvantaged areas of Sweden. *BMC Public Health* 2022;22:1091.
- Burström B, Marttila A, Kulane A, et al. Practising proportionate universalism—a study protocol of an extended postnatal home visiting programme in a disadvantaged area in Stockholm, Sweden. *BMC Health Serv Res* 2017;17:91:91.
- Cox JL, Holden JM, Sagovsky R. Detection of postnatal depression. development of the 10-item Edinburgh postnatal depression scale. *Br J Psychiatry* 1987;150:782–6.
- Derwig M. Instruktioner för mätning och vägning på BVC. Available: <https://www.rikshandboken-bhv.se/tillvaxt--utveckling/tillvaxt/instruktioner-for-matning-och-vagning-pa-bvc/> [Accessed 5 Sep 2022].
- Cole TJ, Lobstein T. Extended International (IOTF) body mass index cut-offs for thinness, overweight and obesity. *Pediatr Obes* 2012;7:284–94.
- Mattsson CM, Mårild S, Pehrsson NG. Evaluation of a language-screening programme for 2.5-year-olds at child health centres in Sweden. *Acta Paediatr* 2001;90:339–44.
- Westerlund M, Sundelin C. Can severe language disability be identified in three-year-olds? evaluation of a routine screening procedure. *Acta Paediatr* 2000;89:94–100.
- Cook DG, Strachan DP. Health effects of passive smoking—10: summary of effects of parental smoking on the respiratory health of children and implications for research. *Thorax* 1999;54:357–66.
- Makadia LD, Roper PJ, Andrews JO, et al. Tobacco use and smoke exposure in children: new trends, harm, and strategies to improve health outcomes. *Curr Allergy Asthma Rep* 2017;17:55.
- Wallby T, Hjern A. Parental region of birth, socio-economic status and infants' exposure to second-hand smoke. *Acta Paediatr* 2008;97:1542–5.
- Meek JY, Noble L. Policy statement: breastfeeding and the use of human milk. *Pediatrics* 2022;150:e2022057988.
- Arvidsson E, Dahlin S, Anell A. Conditions and barriers for quality improvement work: a qualitative study of how professionals and health centre managers experience audit and feedback practices in Swedish primary care. *BMC Fam Pract* 2021;22:113:113.
- Regeringskansliet. *SOU 2021:34, Börja med barnen! - en sammanhållen god och nära vård för barn och unga*. Stockholm: Statens offentliga utredningar, 2021.
- Regeringskansliet. *SOU 2021:78, Börja med barnen! - Följa upp hälsa och dela information För en god och nära vård. slutbetänkande av utredningen om en sammanhållen god och nära vård För barn och unga*. In: *Socialdepartementet*. Stockholm: Statens offentliga utredningar, 2021: 272.
- Siu AL, US Preventive Services Task Force. Screening for speech and language delay and disorders in children aged 5 years or younger: US preventive services Task force recommendation statement. *Pediatrics* 2015;136:e474–81.
- Cox J. Thirty years with the Edinburgh postnatal depression scale: voices from the past and recommendations for the future. *Br J Psychiatry* 2019;214:127–9.
- UK National Screening Committee. Child screening programme obesity. 2018. Available: <https://view-health-screening-recommendations.service.gov.uk/obesity/>