

PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	The Children and Young People's Health Partnership Evelina London Model of Care: economic evaluation protocol of a complex system change
AUTHORS	Soley-Bori, Marina; Lingam, Raghu; Satherley, Rose-Marie; Forman, Julia; Cecil, E; Fox-Rushby, Julia; Wolfe, Ingrid

VERSION 1 – REVIEW

REVIEWER	Berntsen, Gro University Hospital of North Norway
REVIEW RETURNED	24-Jan-2021

GENERAL COMMENTS	<p>Review of «The Children and Young People's Health Partnership Evelina London Model of Care: economic evaluation protocol of a complex system change»</p> <p>This is a protocol for an economic evaluation. The intervention under evaluation seeks to provide integrated care for Children and Young people (CYP)e with Long term Care needs (LTC). The intervention is set in the geographic area of Southwark and Lambeth, where the population linked to 23 GP clinics are cluster-randomized to either the intervention or control. The control population consists of all CYP living in the control clusters. The intervention is available to all CYP patients living in intervention clusters. Patients with "tracer conditions": Asthma, Constipation and Exczema, are followed at an individual level, while all other patients are followed at the population level.</p> <p>Control areas:</p> <p>all populations get access to usual care, which include: Digital decision support for common pediatric conditions in the GPs electronic health record (EHR), a pediatric hotline to link GPs and pediatricians, school based mental support, and mapping and follow-up of bio-psycho-social health through a questionnaire: Health Check, for patients with tracer conditions.</p> <p>The intervention areas:</p> <p>Universal approach:</p>
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consists of the following additional components for all CYP patients: Clinics with integrated pediatrician – GP and multidisciplinary approach.

For professionals: training of providing team based, integrated care in three forms: Multi-disciplinary case planning, lunch-and-learn sessions and Specialist team training.

Targeted approach:

consists of the following additional components for patients with Tracer conditions: A specialist nurse-led team follow-up with health promotion and self-management focus coupled with digital messages encouraging patients / parents to be involved in the preventive self-management of their own care.

The cost analyses:

Population cost: Cost of care for all patients 0-16 y. control vs intervention population costs. Measured in: Health service utilization at primary and secondary care, at baseline, 6 and 12 months.

Tracer population:

Cost-benefit, PedsQL outcome (CYP) and Warwick-Edinburg Mental Wellbeing Scale for parental wellbeing. Societal perspective, including costs for both health care, parents and schools. Will follow NICE guidelines.

Cost-utility, with QALYs as outcome, with NHS perspective

Cost-utility, with QALYs as outcome, with Personal Social Services Perspective.

Collection of cost information for each of these perspectives is then presented both in the text on p 7 and in Table 3.

General Comments:

It is a strength of the study that it plans on both a societal, a health service and a Social services perspective in the cost-analyses. The collection of costing data, and the cost-benefit analyses seem comprehensive and sound. The main protocol builds on a strong stakeholder involvement and a theoretical foundation which are both strengths. The protocols outline an approach that is integrated and pro-active, and I share a belief that these are necessary elements of high quality care. The study includes both a process and an outcomes evaluation, both which are necessary to understand complex interventions. The protocol has been registered at Clinical Trials.gov.

Major comments:

Ties to the original Evelina protocol

It is absolutely necessary to read the main trial protocol to be able to understand this protocol for economic evaluation {Newham, 2019 #13495}. The main protocol is tied into a theoretical framework and has a strong stakeholder involvement in the design

process. The challenge is that if this protocol is read as a stand alone document, these strengths of the main study are not readily visible. This protocol should give a summary synopsis of the important points from the main protocol, such as the theoretical underpinnings and stakeholder involvement.

Person-centeredness.

Both the main protocol and this paper outline a commitment to being responsive to patient and family needs, and to integrate care across bio-psycho-and social domains. These are elements that often tie into a tailoring to personalized or individualized needs, values and preferences of the patient. However, the most commonly used term for such tailored care: Person-centered care (PCC) is never used, in either document. I am curious as to why the authors did not use this term, when their goals seem to be fully in line with the tenets of PCC.

Clarity of the text:

It is difficult to follow the description of the intervention in terms of which groups get what kind of intervention. I had to read the text very carefully, multiple times and refer to the original protocol paper to understand what was going on. My understanding is reflected in the description above, which I am still not sure is accurate. The terminology used to reference the different components is not consistent, and it is often unclear who the components are directed at.

For instance: Specialist nurse-led team services (Text p4 and Table 1) is, I think, also called “2.Specialist team Service” (table 2) and “Specialist nurse-led services” in Table 3. Are these the same or different services?

The intervention directed at professionals described in the last paragraph on page 4, starts with the words: “Multidisciplinary team case-planning is important for CYPHP delivery, present in both universal and targeted services...”, which only later in the paragraph makes mention of this being training for case planning directed at professionals. The switch to professional training is subtle and I had to read this passage many times to understand that the “Multidisciplinary team case-planning” was directed at professionals only.

The authors should tidy their presentation of the intervention, so that it is clear which interventions are directed at which groups, with consistent vocabulary. I suggest that they do not present the same information more than once. Now table 1 and table 2 and the text on p 4 are overlapping, and it is difficult to understand what is genuinely new information and what is already presented elsewhere.

I suggest they apply the most common way to present such information in an RCT, which is a flow-chart showing how the

	<p>patient population is separated into different groups and a similar flow-chart for intervention components directed at professionals. The flow-chart establishes the terminology which is then used consistently throughout.</p> <p>Terminology of comprehensive integrated care:</p> <p>It is a general problem in the field of integrated care, that there is no commonly acknowledged terminology for the types of interventions that are in use. Thus, many authors introduce their own new terminology to describe their interventions. So also in this study, where we are introduced to “in-reach clinics” and the “CYPHP-universal services”. This makes it difficult for other researchers in the field to understand what the intervention actually does, difficult to compare results across studies, and difficult to repeat studies in new contexts. It would be helpful to understand the intervention better, to provide examples. For each study-specific term, to give an example of what the care would look like for the target of the intervention, i.e. the patient-provider level, or for the professional receiving training. Terms that would benefit from such explanations are: In reach clinics. Specialist nurse-led team services. Population health management. Etc. It might also benefit the study to frame their work within the terminology of the WHO – integrated people-centered care model {WHO, 2015 #10783}, which is perhaps the most widely endorsed framework for integrated care services to date.</p> <p>Health Check.</p> <p>The intervention seems to rely heavily on a questionnaire named: “Health Check” which is described as a bio-psycho-social mapping tool. There are however no references to support the validity or reliability of this tool in the current document, nor in the main protocol. Is it linked to: https://www.healthcheck.org/ ? Please provide more information on this tool, as it seems critical for casefinding for the study.</p> <p>Minor comments:</p> <p>Although the BMJ Open obviously caters to a British audience, the BMJ Open has an international readership who may not be intimately familiar with the various components of the NHS. Terms such as “Personal Social Services (PSS)” need an explanation. Please go through the manuscript and explain what the different British service components are, or add references where this might be found.</p>
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REVIEWER	Razai, M St George's University of London, Population Health Research Institute
REVIEW RETURNED	07-Mar-2021

GENERAL COMMENTS	Thank you for the opportunity to review this paper. I believe the protocol is robust and the authors have addressed all aspects of the study quite well. I believe there is a paucity of evidence on the
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	economic evaluation of children's services and the Evelina model will hopefully bring some new information on these very complex issues relevant to primary care and the health service. I note the authors' discussion of the limitations but it is limited in scope to just discussing the impact of covid-19. It would be significant to discuss the limitations of the protocol and the ongoing study in greater detail here.
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REVIEWER	Kien, Vu Duy OnCare Medical Technology Company Limited
REVIEW RETURNED	01-May-2021

GENERAL COMMENTS	<p>I have some comments for consideration:</p> <p>Introduction</p> <ul style="list-style-type: none"> - I suggest that the authors should focus more on the topic of the protocol. Please more detail on why the economic evaluation should be important. -Line 49-60, page3: Please provide more specific objectives. What should be the "impact"? and what should be the outcome of "the cost-effectiveness" and "cost-utility"? <p>Method</p> <ul style="list-style-type: none"> -I think the authors should provide more detail about the trial, e.g., sample size, sampling and data collection. -What should be the main outcome variables in this study? I think the authors should define them clearly, and provide in detail how to measure them. -I found that the authors mentioned several questionnaires to estimate the quality of life, e.g., Pediatric Quality of Life Inventory and Child Health Utility. So, how the authors combine them or do the authors use them separately? Please make it clear -In addition, Warwick-Edinburg Mental Wellbeing Scale will be used for the parent. So, why the authors need this measurement. Please make it clear. -In the statistical analysis section, the authors mentioned several regression models, but it was unclear which models and how many models would be used. In addition, please explain more detail in each model about an outcome variable and explanatory variables.
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VERSION 1 – AUTHOR RESPONSE

Reviewer 1, Dr. Gro Berntsen, University Hospital of North Norway

a. We agree with the reviewer about the importance of including the essential elements of the study design and intervention in this protocol so it can read as a standalone paper. Details on study design are provided both in the introduction (p.3, lines 109-115) and methods and analysis section (p.4, lines 138-147). The intervention is described in detail in section 2.2 (p.4-7, lines 151-234). We have added a new Table with the following additional information as requested by the reviewer: targeted recruitment sample, theoretical route to change, strengths, and stakeholder involvement (Table 1, p.4).

b. The reviewer is right, PCC is essential to design and implement effective models of integrated care. The integration of healthcare across primary and secondary care settings, mental and physical health services, should respond to patient needs. Our working definition of integrated care is user-led and corresponds to the one employed by the NHS “My care is planned with people who work together to understand me and my carer(s), put me in control, coordinate and deliver services to achieve my best outcomes”. It highlights the importance of accounting for population and individual needs in design, implementation and evaluation of integrated care models. Many of the tenets of PCC correspond with our concept of a bio-psycho-social model. We considered Child Centred Care (as a more commonly used term in paediatrics) however, we have kept the term bio-psycho-social model as we feel this is more specific; it clearly defines our working principles, describing the qualities that we consider to be central to achieving centred care. We have added two sentences about this on page 3 (lines 106-108): “The concept of biopsychosocial care follows many of the tenets of patient centred care as outlined by Tramonti and colleagues (20), however we use a more specific term to describe the model in greater detail.”

c. Thank you for the careful review and for picking these inconsistencies up. The reviewer is right, specialist nurse-led team service, specialist team service, and specialist nurse-led service all refer to the same intervention component. We now use specialist nurse-led service consistently throughout the text. We have incorporated the following changes aimed at improving the explanation of the intervention components:

- We have created a new Figure (Figure 1), which presents a study population and intervention flow-chart as requested by the reviewer (page 6, and also included below).
- We have connected more closely the explanation of the intervention components with Figure 1 by following the same enumeration (1-6) (p.5, lines 159-195). We also follow the same enumeration in Table 3 now (p.9).
- We have moved up the explanation of specialist team training so the reader can clearly see that it belongs to the specialist service (p.5, lines 190-192).

We still think that Table 2 is important as it details the protocolised inputs, frequency, and duration of each CYPHP component. But we have incorporated one of its previous columns, “recipient”, into Figure 1.

d. We agree with the reviewer about the importance of using, when possible, consistent terminology to facilitate comparisons across integrated care interventions. This effort is sometimes challenged by the people-centred nature of integrated care, as interventions need to be tailored to the target population, including specific health conditions and sociodemographic characteristics. The intervention components of CYPHP have been carefully labelled to differentiate between universal care (care targeted at all children and young people) versus specialist care (care for children and young people with tracer conditions). Terminology also tries to indicate who delivers the intervention (specialist nurse led service) and where care is offered (in-reach clinics are part of community care, hopefully in close proximity to the patient). While we defined all these concepts on pages 4 and 5, we have expanded the definition of population health management and it currently reads as follows (p.5, lines 185-189): “Population health management, where CYP with tracer conditions are sent text messages and a letter from their GP, encouraging them to participate in early intervention and care. Recipients are identified based on analyses of electronic health records and actively reached out to connect them with the healthcare system and improve the management of their conditions before they exacerbate.”

We have also indicated the recipient of each intervention component in the new Figure 1. We have also clarified in the introduction (p.3, lines 106-108) the relationship between PCC and our concept of a bio-psycho-social model: “The concept of biopsychosocial care follows many of the tenets of patient centred care as outlined by Tramonti and colleagues (20), however we use a more specific term to describe the

model in greater detail.” We prefer to use the term bio-psycho-social model as we feel this is more descriptive and clearly defines our working principles, describing the dimensions that we consider to be patient centred care.

Finally, we have also included a reference to our recently developed handbook describing how to provide CYPHP (p.6, line 205).

e. We have relabelled the “Health Check” as “CYPHP Health Check” to differentiate it from the “NHS Health Check”, which is for ages 40-74. We have added more information on the CYPHP Health Check, including the specific questionnaires it includes and references to their validation (p.5, lines 173-184). The updated section now reads as follows: “The CYPHP Health Check is administered to patients with asthma, constipation, or eczema. It uses validated questionnaires when possible to measure biopsychosocial health. Child’s ongoing conditions are assessed with the Patient Oriented Eczema Measure (POEM)(21) for children with eczema, the Asthma Control Test (ACT)(22) for asthma, and a bespoke CYPHP constipation questionnaire (validation work underway). The Strengths and Difficulties Questionnaire (SDQ)(23) is used as an emotional and behavioural screening questionnaire. Finally, a set of bespoke social questions to understand a family’s broader situation and factors that may affect their health and care, such as financial issues and days lost of school or work, are also included. Participants who consent as research subjects, do also complete the Paediatric Quality of Life Inventory (PedsQL)(24) and the Child Health Utility 9-D (CHU-9D)(25).”.

f. We have added a reference for the NICE reference case, which also refers to PSS, on page 3, line 121. We have also added the following definition of PSS (p.7, lines 234-236): “PSS includes a range of services provided by local authorities for vulnerable groups, including the mentally and physically disabled, older people, and neglected children”

3. Reviewer 2, Dr. M Razai, University of London

a. Thanks for your positive comments. We have added two more limitations, one on variability in intervention delivery and another on measurement challenges of using the CHU9D among children below 5 years of age. Both are discussed on page 11, lines 389-395: “Variability in service intensity across practices and its impact on cost-effectiveness results will be assessed in sensitivity analyses. Additionally, health utility outcome measurement for children below 5 may lack reliability as the psychometrics of the questionnaire have not been established for this younger age group (44,45). This measurement challenge will be addressed by using multiple economic evaluation perspectives and health outcomes (such as the PedsQL) to provide a comprehensive and transparent assessment of the effects of the intervention.” We have also added both limitations on Strengths and Limitations of this study (p.2, lines 72-74).

4. Reviewer 3, Dr. Vu Duy Kien, OnCare Medical Technology Company Limited

a. Thanks for your feedback. Page 3, lines 116-124, try to capture the goals of the economic evaluation and its importance. The first goal of the economic evaluation is to assess at a population level the impact of CYPHP on healthcare costs. The second set of analyses are based on the RCT and will explore the cost-effectiveness, cost-utility, and cost-benefit of CYPHP compared to EUC. These analyses will compare health outcomes and costs effects related to the intervention. We have added two more sentences that try to clearly state why the economic evaluation is important (p.4, lines 129-132): “Both the economic evaluation and the state-transition model are important as they will determine whether potential health gains related to the intervention justify its costs relative to current practice, and therefore whether a decision to provide and roll-out the intervention is justifiable in terms of efficiency”. We also underscore the importance of the long-term model on page 4, lines 126-129: “ Existing evaluations of interventions to

improve outcomes for children with tracer conditions (such as education initiatives) rarely consider effects beyond 3 years, which may result in a partial characterization of the intervention effects, and as such this method is a novel application in child health economic research.”

b. We think the reviewer is referring to the following sentence: “The aims of the embedded economic evaluation is, first, to assess the impact of CYPHP compared to EUC on patient-level health care costs from an NHS and Personal Social Service (PSS) perspective for the entire trial population” (p.3, lines 116-118). We indicate in the second part of the sentence that we are referring to the impact of CYPHP on health care costs. For the second objective related to the cost-effectiveness and cost-utility analyses, we have included a few words to clarify that both costs and health outcomes will be considered. We have also specified the final measures of the cost-effectiveness analysis (cost per point improvement in the PedsQL), cost-utility analysis (cost per QALY), and cost-benefit analysis (cost per monetarized unit of WEMWBS and QALYs). The updated sentences now read as follows (p.3, lines 118-123): “Second, among children with specific targeted tracer conditions, to compare costs and health outcomes and establish the cost-effectiveness (cost per point improvement in the PedsQL) and cost-utility (cost per QALY) of CYPHP versus EUC also from an NHS and PSS perspective (NICE reference case(20)). Third, to capture the impact of this complex system change across government sectors, parents, and CYP, a cost-benefit analysis (cost per monetarized unit of WEMWBS and QALYs) of CYPHP compared to EUC from a societal perspective will also be conducted”.

c. We have added a summary of key features of the CYPHP intervention and evaluation in Table 1, including targeted recruitment sample, theoretical route to change, main strengths, and stakeholder involvement:

We have also expanded the definition of the questionnaires included in the CYPHP Health Check (p.5, lines 173-184): “The CYPHP Health Check is administered to patients with asthma, constipation, or eczema. It uses validated questionnaires when possible to measure biopsychosocial health. Child’s ongoing conditions are assessed with the Patient Oriented Eczema Measure (POEM)(22) for children with eczema, the Asthma Control Test (ACT)(23) for asthma, and a bespoke CYPHP constipation questionnaire (validation work underway). The Strengths and Difficulties Questionnaire (SDQ)(24) is used as an emotional and behavioural screening questionnaire. Finally, a set of bespoke social questions to understand a family’s broader situation and factors that may affect their health and care, such as financial worries and days lost of school or work, are also included. Participants who consent as research subjects, do also complete the Paediatric Quality of Life Inventory (PedsQL)(25) and the Child Health Utility 9-D (CHU-9D)(26).”

d. The main outcome variables are described in section “Measurement and valuation of health outcomes” (p. 9, lines 302-323). The two main health outcome measures are the PedsQL (p.9, lines 303-307) and the CHU-9D (p.9, lines 307-313). We also indicate that the health outcome measure in the cost-benefit analysis will be a monetary value, resulting from converting QALYs and scores from the WEMWBS questionnaire to £ amounts (p. 10, lines 341-346). We agree with the reviewer about the importance of making our final study outcomes and measures very clear given the complexity of the intervention and the variety of analyses conducted (3 economic evaluations). Therefore, we have added the specific final measures for each economic evaluation on page 3, lines 118-124, it now reads as: “Second, among children with specific targeted tracer conditions, to compare costs and health outcomes and establish the cost-effectiveness (cost per point improvement in the PedsQL) and cost-utility (cost per QALY) of CYPHP versus EUC also from an NHS and PSS perspective (NICE reference case(20)). Third, to capture the impact of this complex system change across government sectors, parents, and CYP, a cost-benefit analysis (cost per monetarized unit of WEMWBS and QALYs) of CYPHP compared to EUC from a societal perspective will also be conducted”.

e. As indicated on page 8, lines 254-259. the two questionnaires will be used as health outcomes measures in separate economic evaluation analyses. The PedsQL will be used in the cost-effectiveness analysis, while the CHU-9D in the cost-utility analysis.

f. The Warwick-Edinburg Mental Wellbeing (WEMWBS) will be used in our third economic evaluation: a cost-benefit analysis from a societal perspective. We believe that using the broader societal perspective, rather than the traditional NHS/PSS perspective, is important to capture health and cost effects that fall on other parties. Under the societal perspective, we will include as additional costs time lost from school and work and referrals to social services. We will also consider health impacts on parents, measured through the WEMWBS. Children's health status and care management needs are likely to impact parents in terms of days missed of work and overall mental wellbeing. As indicated on page 10, lines 341-346, we will combine children's health status (measured by the CHU-9D) and parental wellbeing (measured by the WEMWBS) by assigning monetary values to each of them so they can be added together.

g. Thanks for this comment. We think that the reviewer is referring to page 11, lines 353-359. We have clarified that four multilevel regression models will be estimated and incorporated minor edits to improve clarity. The current section reads as follows: "Third, to adjust for treatment group imbalances, four multilevel regression models will be estimated; one each for total costs, QALYs, PedsQL score, and monetary benefits (£ corresponding to QALYs and WEBWMS scores together)(42). Each model will include a variable indicating participation in intervention or control and variables that, despite randomization, may still be unequally distributed between intervention and control groups such as age, gender and deprivation level for the patient-level models. For the regression model predicting QALYs, the baseline QALYs will also be controlled for(43)".

We would like to also suggest the following minor changes to the editor:

- Page 7, line 240, now states "0-15 years old", rather than 0-16, as our study inclusion criteria is children and young people below 16 years old.
- Page 9, line 295, now states "for base cost year 2019/2020", rather than 2020/2021 as the 2020/2021 information is not available yet for the inflation indexes.
- Page 9, line 295, now states "the NHS Cost Inflation Index (NHSCII) will be used to adjust for inflation" as we realised that the Hospital and Community Health Services pay and price index is not used anymore as it has been replaced by the NHS cost inflation index.
- We have added section 2.3 Patient and Public Involvement (p.6, lines 207-212), as requested by the journal.

VERSION 2 – REVIEW

REVIEWER	Berntsen, Gro University Hospital of North Norway
REVIEW RETURNED	13-Jul-2021

GENERAL COMMENTS

This is a protocol for an economic evaluation of The Evelina London Model of Care for Children and Young people (CYP) with Long term Care needs (LTC).

The intervention is set in the geographic area of Southwark and Lambeth, where the population linked to 23 GP clinics are cluster-randomized to either the intervention or control.

The authors should be congratulated on their efforts in providing cost analyses for such a complex intervention. Both the intervention and the cost analysis protocol are quite ambitious and complex. However, as the authors also point out, there is an evidence gap on the effects of integrated and bio-psycho-social care, especially with respect to cost-data. The intervention has been designed with the involvement of both patients, professionals and system level decision makers, which is essential to arrive at viable service designs.

The paper has become much clearer in its second round. The Figure 1 is clarifying, although there are still some room for improvement (see more specific comments later). The background for the paper is well written and clear. The measurement and statistical methods are exemplary. It is a strength that the authors will do both cost-effectiveness, cost-utility, and cost-benefit analyses.

There are some areas for improvement in terms of clarity.

It is now much easier to understand the nature of the intervention, without having to refer to the original protocol documents, which is a huge improvement. There is however still a need for some clarifications:

Line 106: The control groups will also receive an intervention, which is named "Enhanced Usual Care". Enhanced Usual Care – indicates that also the Control group is receiving some kind of intervention or change. EUC is only summarily described in Fig 1, but the key-words there indicate that the control group is also undergoing a complex intervention with introduction of tools that may be important for outcomes. Tools such as GP-decision tools, pediatric hotline, and more. Please describe who is responsible for EUC and if there are any synergies or possible side-effects of the two simultaneous implementations.

Line 117 and line 234: What is the PSS perspective? The explanation given in line 234, should be moved up to the first mention of PSS in line 117. Please underline, that even though it is named a "personal", PSS represents a service perspective, not a patient/ personal perspective. This may be implicit for a UK citizen, but for me it was not

Line 121: This sentence does not sound right and is difficult to understand. Suggest this sentence is split into two. Add following to last sentence (moved from methods): "The cost-benefit analysis

	<p>will take a societal perspective and additionally account for costs falling on parents, and schools, as well as valuing parental wellbeing.”</p> <p>Line 129 states: “Both the economic evaluation and the state-transition model are essential as they will determine whether potential health gains related to the intervention justify its costs relative to current practice,” But you are not comparing to “current practice”, but to an “enhanced Usual Care” Be consistent in language.</p> <p>Line 151: In Fig 1 it seems that EUC is delivered only in the Control arm. However in paragraph starting on line 151, it is indicated that EUC is delivered in both intervention and control practices. The latter would be the correct thing to do, or the two groups would not be comparable. Please correct fig1, so that it is clear that both groups receive EUC</p> <p>Line 185: Inconsistency between figure 1 and text : Are “population health management” and “population evaluation” the same? the Population evaluation and tracer condition follow-up in Fig 1 is drawn up in such a way that it seems like it is delivered in both control and intervention groups. However at line 185 and forward in the text, it is clear that population health management is only provided for intervention group. Please clarify</p> <p>Line 201: “CYP access CYPHP universal services via pediatrician or GP referrals” Unclear sentence. Was it meant to be a headline?</p> <p>Line 247: Is “Resource use” equivalent to “intervention delivery costs”? The latter would make this paragraph easier to understand, as “resource use” includes both intervention delivery, and outcomes.</p> <p>Line 317: Suggest to delete sentence” Multiple imputation will be used for questionnaires with missing values.”, because this information is given in paragraph starting on line 346.</p>
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REVIEWER	Kien, Vu Duy OnCare Medical Technology Company Limited
REVIEW RETURNED	30-Jun-2021

GENERAL COMMENTS	I have no further comment. Goodluck!
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VERSION 2 – AUTHOR RESPONSE

Reviewer 1, Dr. Gro Berntsen, University Hospital of North Norway

a.RESPONSE: Thanks for your comment. The same team concurrently implemented both CYPHP and EUC. EUC was implemented across the whole geographic area, while the CYPHP model (EUC + additional services) only in the intervention practices. The implementation team did not report any synergies or side effects caused by the additional services in CYPHP. We have incorporated the following two points to clarify that intervention practices also have EUC:

-When EUC is first mentioned, we indicate that its components are also in the intervention arm: “CYPHP includes the EUC components, but also in-reach clinics, lunch-and-learn sessions, specialist nurse-led

services, population health management, specialist team training, and multidisciplinary team case planning.” (p.3, lines 114-116).

-We have added “PLUS all services offered in EUC” to the CYPHP components presented in Figure 1.

b.RESPONSE: We have moved the sentence “PSS includes a range of services provided by local authorities for vulnerable groups, including the mentally and physically disabled, older people, and neglected children.” up to page 3, as suggested by the reviewer. As the explanation includes “a range of services provided by local authorities” we think it clarifies that PSS represents a service perspective rather than a patient/personal perspective.

c.RESPONSE: We have edited the sentence and incorporated reviewer’s suggestion. The updated sentence reads as follows: “Third, a cost-benefit analysis (cost per monetarized unit of parental wellbeing and children’s QALYs) of CYPHP compared to EUC from a societal perspective will be conducted. The cost-benefit analysis will also account for costs falling on parents and schools” (p.4, lines 125-128). The corresponding sentence in the methods section has been modified accordingly to avoid content duplication (p.7, line 241).

d.RESPONSE: We have replaced “current practice” by EUC.

e.RESPONSE: The reviewer is right. We have added “PLUS all services offered in EUC” to the CYPHP components presented in Figure 1.

f.RESPONSE: No, population health management is a component of CYPHP, “where CYP with tracer conditions are sent text messages and a letter from their GP, encouraging them to participate in early intervention and care.” (p.5, line 188). The term “population evaluation” in Figure 1 corresponded to section “2.4.1. Population-level cost analysis”. We have modified Figure 1 “Population evaluation” to “Population-level analysis” to improve clarity and ensure consistency in terminology.

g.RESPONSE: We have modified the sentence and now it reads as: “Children and young people access universal services through referrals from their pediatrician or GP.”

h.RESPONSE: No, “resource use” includes intervention delivery costs, but also health and social services utilisation by patients, and time lost from school or work by patients and parents. We have modified the following sentences on page 7 (lines 252, 253) so this becomes clearer: “From an NHS and PSS perspective, resources used relate to the delivery of the intervention, health and social care use by patients, and time at school and work lost (Table 3).”

i.RESPONSE: We have deleted the sentence as suggested by the reviewer.