

# An evaluation of the impact of water and sanitation interventions on the health of children in Nepal

<b>Submission date</b> 13/05/2021	<b>Recruitment status</b> No longer recruiting	<input type="checkbox"/> Prospectively registered <input checked="" type="checkbox"/> Protocol
<b>Registration date</b> 25/05/2021	<b>Overall study status</b> Completed	<input type="checkbox"/> Statistical analysis plan <input checked="" type="checkbox"/> Results
<b>Last Edited</b> 04/01/2022	<b>Condition category</b> Infections and Infestations	<input type="checkbox"/> Individual participant data

## Plain English summary of protocol

### Background and study aims

One of the important factors to cause serious health impacts among children is the lack of access to clean water. Various types of pathogens can affect children in many different ways such as the ones causing water-borne diseases such as cholera, diarrhea, and intestinal parasitic infections. There are various ways of fecal contamination of drinking water. Moreover, adequate nutrition is also essential among children for ensuring healthy growth, proper organ formation and function, and neurological and cognitive development. However, nutrition as a cross-cutting theme is closely interlinked with multifactorial determinants. Hence the objective of this research is to analyse the impacts of water quality and hygiene interventions on water quality at the point-of collection as well as point of consumption; availability, condition, and use of WASH infrastructure; knowledge, attitude, and practice of water management and hygiene; and to determine the burden of water-borne diseases, malnutrition, nutritional deficiency, and anemia among children within the households before and after the intervention.

### Who can participate?

Households with at least one child aged less than 10 years will be involved in the study.

### What does the study involve?

A randomized controlled trial will be conducted following a repeated cross-sectional assessment in Western Nepal. Intervention packages will be developed. The study will deepen the understanding of the effectiveness of interventions aiming at improving WASH and nutrition status in rural households in Nepal and provide scientific evidence on the health impact of such interventions. The results of the study will provide scientific evidence for the adjustment or replication of programs for preventing water contamination and reducing the WASH-related health burden in Nepal.

### What are the possible benefits and risks of participating?

There is no risk of participation however there are benefits associated with participation. All the participants will receive training on improved hygiene, sanitation, and household water treatment, including facilitated access to products required for water treatment. In control

areas, the information on water treatment and access to respective products will be provided after final collection. Participants will also be informed about the outcomes of the study and the results of their personal examination. Those found infected with parasites will be treated in accordance with their infection at recommended doses following the standard treatment schemes of WHO.

Where is the study run from?

Selected communities in rural areas of Nepal such as Surkhet, Dailekh, and Accham.

When is the study starting and how long is it expected to run for?

March 2018 to December 2021

Who is funding the study?

Swiss Agency for Development and Cooperation (SDC)

Who is the main contact?

Ms Regula Meierhofer, [Regula.Meierhofer@eawag.ch](mailto:Regula.Meierhofer@eawag.ch)

## Contact information

### Type(s)

Scientific

### Contact name

Mrs Regula Meierhofer

### ORCID ID

<https://orcid.org/0000-0002-9691-9374>

### Contact details

Ueberlandstrasse 133

Dübendorf

Zurich

Switzerland

8600

+41 (0)58 765 50 73

[Regula.Meierhofer@eawag.ch](mailto:Regula.Meierhofer@eawag.ch)

## Additional identifiers

## Study information

### Scientific Title

Evaluation of the impact of water and sanitation interventions on the health status of children in the project area of the Helvetas WARM-P Project in Nepal

### Study objectives

The main assumption of the study is based on the idea that improved water management leading to safe water at the point of consumption either through system level chlorination or adequate household water treatment at the point of consumption and hygiene infrastructure

such as hand washing infrastructure and improved sanitation will lead to a reduction of the water-borne diseases including intestinal parasitic infections.

### **Ethics approval required**

Old ethics approval format

### **Ethics approval(s)**

1. Approved 25/02/2018, Kantonale Ethikkommission Zurich (Stampfenbachstrasse 121, Postfach, 8090 Zurich, Switzerland; +41 43 259 79 70; peter.kleist@kek.zh.ch), ref: 2018-00089
2. Approved 07/06/2018, Institutional Review Committee, Nepal Health Research Council (Ramshah Path, Kathmandu, P.O.Box 7626, Nepal; +977-1-4254220; nhrc@nhrc.gov.np), ref: 2956

### **Study design**

Interventional cluster randomized trial

### **Primary study design**

Interventional

### **Study type(s)**

Prevention

### **Health condition(s) or problem(s) studied**

Water, sanitation and hygiene, Communicable diseases (soil-transmitted helminthes and protozoa) and Nutrition

### **Interventions**

A randomized controlled trial (RCT) will be conducted in rural areas of Dailekh, Surkhet (A and B) and Acchham, following a cross-sectional baseline assessment on situational factors, water quality at the point of collection and point of use, WASH infrastructure, knowledge, attitude and practice as well as health indicators using standardized tools. The follow-up assessment will be conducted 2 years after the intervention. One to one matching with the intervention area will be done for the selection of the control area.

The study will comprise of the following intervention schemes:

Baseline scenario Intervention No of households

Area A PWS HHH + S-CHL 375

Area B PWS HHH + HWTS 375

Area C PWS HHH 375

Area D (Control) PWS - 375

PWS is an area with the availability of a piped water supply scheme, that has not yet received the WARM-P training intervention

HHH household hygiene intervention in accordance with the WARM-P training, but not establishing access to products for household water treatment

HWTS providing access to high quality products for household water treatment and safe storage, including training on adequate product operation and maintenance

S-CHL providing scheme-level chlorination

### **Intervention Type**

Behavioural

### **Primary outcome(s)**

Water quality examined using the membrane filtration technique and colony-forming units of total coliforms and Escherichia coli were counted at baseline (2018) and will be counted during follow-up study (2021)

### **Key secondary outcome(s)**

1. Clinical signs of nutritional deficiencies measured by the certified medical assistants using a standard checklist at baseline (2018) and will be measured during follow-up (2021)
2. Anthropometric measurements (height, weight and length) of the children under 10 years was measured adhering to the standard procedures and calculated using AnthroPlus (WHO; Geneva, Switzerland) in accordance with the World Health Organization guidelines at baseline (2018) and will be repeated at follow-up (2021)
3. Presence of worm infection and intensity of helminths eggs per gram of stools was examined at baseline (2018) and will be repeated at follow-up (2021)
4. Knowledge, attitude and practice questions related to water, sanitation and hygiene and health were administered using a quantitative, structured questionnaire to the children's caregivers (mostly mothers) at baseline (2018) and will be repeated at follow-up (2021)

### **Completion date**

12/12/2021

## **Eligibility**

### **Key inclusion criteria**

1. Households located in the project implemented areas
2. Households with at least one child in the age between 6 months to 10 years will be involved in the study. If a participating household has more than one child, the health of the youngest child will be examined as the vulnerability of young children for diarrheal infections is highest

### **Participant type(s)**

Other

### **Healthy volunteers allowed**

No

### **Age group**

Child

### **Lower age limit**

6 months

### **Upper age limit**

10 years

### **Sex**

All

### **Key exclusion criteria**

1. Households not providing written consents for the study
2. Household without children younger than 10 years

**Date of first enrolment**

15/03/2018

**Date of final enrolment**

12/12/2021

## Locations

**Countries of recruitment**

Nepal

**Study participating centre**

Helvetas

Birendranagar

Surkhet

Nepal

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## Sponsor information

**Organisation**

Swiss Federal Institute of Aquatic Science and Technology

**ROR**

<https://ror.org/00pc48d59>

## Funder(s)

**Funder type**

Government

**Funder Name**

Direktion für Entwicklung und Zusammenarbeit

**Alternative Name(s)**

Swiss Agency for Development and Cooperation, Direction du Développement et de la Coopération, Agencia Suiza para el Desarrollo y la Cooperación, Direzione dello Sviluppo e della Cooperazione, DEZA, SDC, DDC, COSUDE, DSC

**Funding Body Type**

Government organisation

## Funding Body Subtype

National government

## Location

Switzerland

# Results and Publications

## Individual participant data (IPD) sharing plan

The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request. The data collected are covering a sensitive topic and participants in the study provided informed consent under the condition that personal data will be kept confidential and will not be shared with anyone other than members of the survey team and only researchers involved in this study, public authorities and the members of the ethical review boards in Nepal and in Switzerland while keeping confidentiality can access original data. Any inquiries regarding reasonable requests for the data can be directed to the president of the Kantonale Ethikkommission Kanton Zürich, Dr. med. Peter Kleist: peter.kleist@kek.zh.ch

## IPD sharing plan summary

Data sharing statement to be made available at a later date

## Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
<a href="#">Results article</a>	baseline results	15/08/2020	13/05/2021	Yes	No
<a href="#">Protocol file</a>	version v2	25/02/2018	01/06/2021	No	No