



Ambient Air Monitoring of LPG At Scale in South India (AAM-LASSI)

FUNDING SOURCE: Funded by the NIH Clean Cooking Implementation Science Network, US

Summary:

Household air pollution (HAP) associated with solid biomass cook-fuel use is a leading risk factor for the Indian national burden of disease. Nearly 95% of India's households currently have access to clean fuels, particularly liquefied petroleum gas (LPG), on account of Pradhan Mantri Ujjwala Yojana (PMUY), which has provided LPG access to 80 million households since 2016.

Over the past decades, HAP exposure monitoring and epidemiological studies have generated evidence to support the health narrative embedded within PMUY. Multiple avenues of public health messaging effectively translated this evidence for a broad range of audiences across diverse Indian states. While these activities helped PMUY attain its stated target of providing poor families with LPG access, they have not yet resulted in increasing sustained LPG use to levels that protect health. Fuel stacking, the simultaneous use of biomass and LPG, continues to be widespread among PMUY beneficiaries, as suggested by low LPG refill rates.

To evaluate the Reach and Effectiveness of India's large clean cooking fuel distribution program, abbreviated PMUY, and similar programs globally, new methods and metrics are likely required to help inform and develop models to guide important implementation questions.

In an effort to answer the benefits of PMUY program on reductions in HAP, the AAM-LASSI project has deployed a hyperlocal, relatively low-cost PM_{2.5} sensor network across a sample of PMUY villages and combined with LPG access and use data, to develop new metrics to assess LPG coverage and its relationship with air pollution exposure. This study is ongoing in Tamil Nadu (TN), where PMUY has provided 98% of households with access to LPG, but where refill rates continue to be highly variable. This variability provides an optimal setting from which to select villages with alternative intensities of LPG use.

The AAM-LASSI project seeks to answer the following questions across 16 villages, all served by PMUY but with different intensities of LPG usage:

1. What is the relationship between the number of PMUY beneficiaries, annual village-scale per capita LPG refill consumption and ambient PM_{2.5} concentrations?
2. What is the relationship between the percent of households using biomass as their primary fuel and ambient PM_{2.5} concentrations?
3. What requirements (such as LPG coverage, regional sources of pollution, percent using biomass as primary or secondary fuel (stacking)) are needed for PMUY villages to consistently meet the Indian PM_{2.5} National Ambient Air Quality Standard (NAAQS) of 40 µg/m³?
4. What are the predictors of inter- and intra-community variations in ambient PM_{2.5} among PMUY villages?

Prenatal fine particulate matter (PM2.5) and polycyclic aromatic hydrocarbon (PAH) exposures and their association with birthweight

FUNDING SOURCE: Funded by the NIH Fogarty's International Center, US

Summary

The growing burden of disease attributable to air pollution represents a serious public health crisis in India. Despite the ubiquity of exposures that are significantly in excess of the health-based guidelines, there is limited understanding of exposure-response relationships between air pollution exposures and adverse pregnancy outcomes. The proposed study aims to set-up a urban pregnant mother cohort to (i) assess pregnancy period personal exposures to PAHs and PM2.5 (ii) determine exposure-response relationships between PM2.5, PAHs, fetal growth and birth-weight and (iii) evaluate select biomarkers specific to PAHs, and explore the role of nutrition in modifying the effects of PAH exposure on fetal growth and birth weight. Our research group at Sri Ramachandra (SRU) has extensive experience of establishing prospective cohorts across India to study air pollution and health. Few important ones include the ICMR funded Tamil Nadu Air Pollution and Health Effects (TAPHE) cohort of 1300 pregnant women, the NIH funded multi-country Household Air Pollution Intervention Network (HAPIN) trial of 800 mother-child pairs and the Delhi Air Pollution: Health and Effects (DAPHNE) cohort of 600 mother-child pairs. Building on these experiences, the study will establish an urban cohort of 300 pregnant women recruited from outpatient clinics of SRU in Chennai city. Eligible and consenting subjects will be given personal sensors to monitor PM2.5 and PAH exposures during each trimester. Fetal ultrasound will be performed by SRU ultrasonologists to measure head circumference, femur length, abdominal circumference and biparietal diameter. Infant weight and length will be measured within 24 hours of birth. Additionally, biomarkers specific to PAHs will be measured in cord blood, maternal blood and urine to explore the mechanistic link between PAH exposure, oxidative stress, and fetal/infant growth. Dietary intake will be captured using validated food frequency questionnaire to examine effect modification. The project activities are designed to provide extensive training in research methods in the fields of environmental health, nutrition, epidemiology, and statistics. Project activities will be performed at SRU, and my career development training is planned at Emory and Harvard Universities, the institutions of my US mentorship team. Together, the research and capacity building activities is expected to create the necessary infra-structure for conduct of rigorous exposure-response studies for a range of environmental exposures and maternal/child health outcomes while also addressing nutritional effect modification using a combination of state of art methodologies in exposure/bio-monitoring. The study will generate the first estimates of early life exposures to PAHs in relation to fetal development and birth-weight from India while also adding important new information to the global pool of evidence. Outputs from this study as well as potential follow-up studies can provide persuasive evidence for policy actions directed at maternal and child health in India and across all LMICs.

Clean Cooking Implementation Science Network Letter of Intent

The Clean Cooking Implementation Science Network (ISN), led by the Fogarty International Center (FIC) of the U.S. National Institutes of Health will provide financial support to the following project:

Project title: Assessing the role of LPG coverage at scale to achieve household air pollution and ambient air pollution exposure reductions using hyper-local, low-cost PM2.5 sensor networks: implications for the Pradhan Mantri Ujjwala Yojana program in India

Mechanism of Support: Subcontract to Sri Ramachandra Institute for Higher Education and Research (Deemed to be University), Chennai (PI: Dr. Kalpana Balakrishnan) through NIH's Contractor, FedPoint Systems (http://fedpointsystems.com/contact_us)

Funding

Date	Amount of Support
July 1, 2020– December 31, 2021	\$ 215,028.00

Terms:

The funding for this project is provided by the NIH Common Fund to the FIC and its collaborators to pursue the development of Implementation Science for Clean cooking to reduce household air pollution and associated disease.

The terms of this support require the investigators and their institutions to make the best effort toward completion of the activities and achievement of outcomes outlined in the referenced project and associated correspondence (Appendix). Any significant deviation from these will require written approval from the ISN Principal Investigator, Dr. Joshua Rosenthal (joshua.rosenthal@nih.gov).

In addition to conducting the research and related objectives outlined in the project proposal, the following terms and conditions of this support apply to the project and associated funding:

- 1) The project principal investigator (PI) agrees to attend an ISN network meeting (to be held either at the NIH or virtually, depending on NIH and CDC travel guidance) during the contract term. If the meeting takes place in person, the ISN will cover travel expenses for up to two attendees from the project to attend, and virtual attendance for others will be an option.
- 2) The project investigator agrees to present the project to the entire ISN and to collaborate on potential changes in the project design associated with learnings from the discussions, to enhance the impact of the ISN's activities as a whole.

Clean Cooking Implementation Science Network Letter of Intent

- 3) All data collected for this research must be made freely available to the global community upon completion of the project, no later than two years after completion of the subcontract. The investigator additionally agrees to share processed data, programming scripts, and other tools used to analyze the data for collaborative activities with the ISN.
- 4) The investigator agrees to publish results from the funded project in peer reviewed journals under open access policies. The cost of open access publication should be borne by the project/the investigators. In case of financial limitations (for example subsequent to multiple open access publications), please discuss options with ISN leadership.
- 5) The investigator further agrees to participate in other dissemination activities of the ISN, including for example the development of jointly planned and drafted publications, presentations at conferences, and participation in webinars.
- 6) All public dissemination of the results of this project should include the following acknowledgment: "This project was supported under the Clean Cooking Implementation Science Network led by Fogarty International Center with support from the NIH Common Fund."
- 7) The investigator agrees to submit a status report by March 1, 2021, and final report on the project's accomplishments and findings in writing by email to FIC (Ashlinn Quinn: ashlinn.quinn@nih.gov) one month after the contract period for the award terminates. The reports will include detailed expenditures from all team members and associated subcontractors. The format for the report will be provided in a subsequent communication.
- 8) Unexpended funds remaining from the execution of this project during the scheduled project year must be reported to FIC staff, and their disposition will be negotiated jointly to ensure appropriate use under the ISN terms.
- 9) The investigators will provide evidence to Dr. Quinn from your institution or the relevant IRB(s) that any primary data collection proposed is exempt from human subjects review requirements or approved by relevant institutional IRBs/Ethics Committees by August 31, 2020.

Signatures:

Project Principal Investigator Kalpana Balakrishna Date 26/06/2020

Business Office Representative [Signature] Date 26/06/2020

Prof. S.P. THYAGARAJAN
Ph.D., MD., D.Sc., FNASc., FAMS, FIMSA, FABMS, F.F.I.M(UK)
PROFESSOR OF EMINENCE & DEAN(RESEARCH)
SRI RAMACHANDRA
INSTITUTE OF HIGHER EDUCATION AND RESEARCH
(Deemed to be University)
(Declared under Section 3 of the UGC Act, 1956)
Porur, Chennai - 600 116.



icmr
INDIAN COUNCIL OF
MEDICAL RESEARCH
Serving the right to health since 1911

भारतीय चिकित्सा अनुसंधान परिषद
स्वास्थ्य अनुसंधान विभाग, स्वास्थ्य और परिवार
कल्याण विभाग, भारत सरकार

Indian Council of Medical Research
Department of Health Research, Ministry of Health
and Family Welfare, Government of India

File No 5/7/1655/CH/Adhoc/2019-RBMCH

Dated: 13-08-2019

To,

The Dean (Research)
Sri Ramachandra Institute of Higher Education and Research,
(Deemed to be University),
Porur, Chennai – 600 116.

Subject : Sanction of Budget Allotment for the ICMR 'Ad-hoc' New Scheme entitled:
"Prenatal Exposure to Air Toxics and Adverse Birth Outcome: An Integrated Rural-
Urban Mother- Child Prospective Cohort Study under Dr. Naveen Puttaswamy, Sri
Ramachandra Institute of Higher Education and Research, Chennai, Tamil Nadu

Sir/Madam,

The Director General of the Council sanctions the above mentioned project with total budget allotment of **Rs.1,00,58732/-** for the duration of **three years** w.e.f. 1st September 2019 to 31st August 2022 subject to the following conditions as mentioned below:-


First Installment full & final of grant-in-aid of **Rs.53,70,011/- (Rupees Fifty Three Lakhs Seventy Thousand Eleven only)** out of the first year sanction budget of **Rs.53,70,011/-** will be released as detailed in the attached statement (**Annexure-I**) for the period from **01/09/2019 to 31/08/2020**.

The grant-in-aid will be given subject to the following conditions.

1. *The payment of the grant will be paid **through RTGS to the head of the Institute**. The first installment of the grant will be paid generally as soon as report regarding appointment of the staff is received by the Council. The Staff appointed on the project should be paid as indicated in the budget statement.
2. The staff on the project will be recruited as per the rules and procedure of the host institute and second part of the undertaking be obtained from the employees of the project.
3. The demand for payment of the subsequent installment of the grant should be placed with the Council in the prescribed Performa. The approved duration of the scheme is **Three Years**. The annual extension will be given after review of the work done on the scheme during the previous year.

4. Ten copies of the annual progress report in the attached prescribed Performance should be submitted to the Council every year after completion of ten months of the project giving complete actual details of the research work done. Failure to submit the report in time may lead to termination of project.
5. **The Institute will maintain a separate saving account of the receipts and the expenditure incurred on the research scheme and will furnish an utilization certificate and an audited statement of the account pertaining to the grant.**
6. The above terms and conditions are indicated on ICMR website.
7. **The institute shall utilize the Grant as per the provisions laid down in the GFRs 2017 and T.A Rules.**

Yours faithfully,


(Harjeet Kaur Bajaj)
Administrative Officer
for Director General

Copy together with a copy of the budget statement forwarded to information to:

1. Dr. Naveen Puttaswamy, Assistant Professor, ICMR Centre for Advanced Research in Air Pollution, Department of Environmental Health Engineering Faculty of Public Health, Sri Ramachandra Institute of Higher Education and Research, Porur, Chennai, Tamil Nadu – 600 116.
2. Accounts. V. for information.
3. Budget forwarded to Budget Section [Finance Section] for compilation of the Council Budget.
4. Dr. Chanchal Goyal, Online Section, **ISRM** (Proposal ID 2019 - 3121).
5. Mr. Birender Singh, Sr. T.O. Division of RBMH & Child Health, ICMR, New Delhi-110029.

Admn. Officer
for Director General

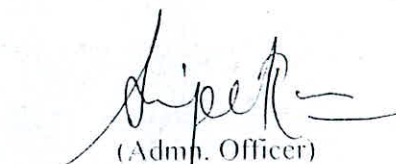
File No. : 5/7/1655/CII/Adhoc/2019-RBMCII
 RFC No : RBMCII/Adhoc/22/2019-20 dated 13/08/2019
 Proposal ID. 2019-3121
 Duration : 03 Years
 Date of start: 01st September 2019

Budget Statement

Period from 01.09.2019 to 31.08.2020

S. No.	Particular's Name	1 st year
B. Staff		
1)	Senior Research Fellow (1) @ Rs. 35000/- + Rs. 8400/- (24% HRA) = Rs. 43400/- p.m	520800
2)	Junior Research Fellow-(2) @ Rs. 31000 + Rs. 7440/- (24% HRA) = Rs. 38,440/- p.m	922560
Sub Total of 'A'		1443360
B	Equipment	600000
C	Recurring	2945000
D	Travel:	200000
	• Field expenses	50000
	• Domestic Travel	
Sub Total of 'D'		250000
E	Overhead Charges (3%) on A+C	131651
Grand Total of (A+B+C+D+E)		5370011

Rupees: Fifty Three Lakhs Seventy Thousand Eleven only


 (Adm. Officer)
 For Director General



ICMR
INDIAN COUNCIL OF
MEDICAL RESEARCH

भारतीय चिकित्सा अनुसंधान परिषद
भारतीय स्वास्थ्य अनुसंधान, स्वास्थ्य और परिवार
कल्याण विभाग, स्वास्थ्य और परिवार कल्याण

Indian Council of Medical Research
Department of Health Research, Ministry of Health,
and Family Welfare, Government of India

No 5/7/1655/CH/Adhoc/2019-RBMCH
Dated: 13-08-2019

Subject: Payment of full & final Installment of 1st year grant – in – aid for '**Ad-hoc**' Project entitled: "Prenatal Exposure to Air Toxics and Adverse Birth Outcome: An Integrated Rural-Urban Mother- Child Prospective Cohort Study under Dr. Naveen Puttaswamy, Sri Ramachandra Medical College & Research Institute, Tamil Nadu"

MEMORANDUM:


Reference this office letter of even number dated: **13/08/2019**.

The Director General, ICMR sanctions the payment of Rs.53,70,011/- (Rupees Fifty Three Lakhs Seventy Thousand Eleven only) as the full & final Installment of 1st year of the grant for incurring expenditure in connection with the above mentioned research scheme. The amount of Rs.53,70,011/- may be debited in the provision of Rs.53,70,011/- made for the above mentioned research scheme for the current financial year 2019-2020.

A formal bill for Rs.53,70,011/- is sent herewith for payment to the Dean, Sri Ramachandra Institute of Higher Education and Research, Porur, Chennai, Tamil Nadu through RTGS. (Mandate form & Cancelled Cheque enclosed).

This is issued with the concurrence of the finance Divn. RFC No: RBMCH/Adhoc/22/2019-20 dated 13/08/2019.

Yours faithfully


(Harjeet Kaur Bajaj)
Admn. Officer
for Director General

Copy together with a copy of the budget statement forwarded to information to:

1. The Dean (Research), Sri Ramachandra Institute of Higher Education and Research, Porur, Chennai, Tamil Nadu - 600 116
2. Dr. Naveen Puttaswamy, Assistant Professor, ICMR Centre for Advanced Research in Air Pollution, Department of Environmental Health Engineering Faculty of Public Health, Sri Ramachandra Institute of Higher Education and Research, Porur, Chennai, Tamil Nadu - 600 116
3. Accounts, V. for information.
4. Budget forwarded to Budget Section [Finance Section] for compilation of the Council Budget.
5. Dr. Chanchal Goyal, Online Section, **ISRM** (Proposal ID 2019 - 3121).
6. Mr. Birender Singh, Sr. T.O. Division of RBMH & Child Health, ICMR, New Delhi-110029.



Dr. P.V. VIJAYARAGHAVAN
Vice-Chancellor
SRI RAMACHANDRA
INSTITUTE OF HIGHER EDUCATION & RESEARCH
(Deemed to be University)
Porur, Chennai-600 116

Admn. Officer
for Director General