Online Data Supplement

Long Term Exposure to Indoor Air Pollution Risk of Tuberculosis

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A. Sampling and Survey Strategy

Two rounds of demographic and health surveys were administered in 2004 and 2009 in Delhi and surrounding areas. A location based probabilistic sampling strategy was employed to select households.[(1)] Eicher Street Map of Delhi and satellite data were used to stratify and select the sample sites. Each of the 190 sheets of the Map of Delhi[(2)] were scanned and mosaicked using Spatial Analyst, an extension of ESRI's ArcGIS.[(3)] Using the hue on the street map, residential areas were extracted. A rectangular gird that closely followed the outline (or geographic extent) of each page of the street map was overlaid onto the residential area. A total of 2000 random points, weighted by residential areas as a proxy of sample size, were simulated. The simulated random points were navigated with the aid of a global position system. Of these 2000 random points, 1,576 were accessible households (at/around these random points) and consented to participate in the first round of survey, administered during January through May 2004. As mandated by the Institutional Review Board of Brown University, household address and name of participants were not recorded. However, XY coordinates of the households were recorded

with the aid of global position system (GPS), which has ±30 m positional accuracy. Given the coarse resolution of GPS, the same households could not be recruited in 2009.

In 2009, the coordinates of the 1,576 households that were surveyed in 2004 were navigated using GPS, and 1,496 households (94.9% coverage) within 50 m distance of these coordinates were recruited and surveyed. In 2004 and 2009, 3,961 and 2,663 subjects, participated in anthropometric measurements, and of these 3,124 and 2,303 subjects, respectively, aged ≥ 15 years and were available at the time of survey, consented to participate in the study. Participants were paid Rupees 100 (US $1.55) each for their cooperation. The survey data collection for both rounds was approved by Institutional Review Boards of Brown University and University of Iowa (IRB approval #0810992578 and #IRB00000100, respectively). The household locations in both rounds were recorded using GPS, which allowed us to develop contextual information around the households.

Graduate students from Jawaharlal Nehru University (JNU), Delhi and physicians with MBBS (Bachelor of Medicine, Bachelor of Surgery) degree were recruited to administer the survey. Four teams were recruited, and each team consisted a male and a female interviewer, and one physician. All four teams worked simultaneously. All teams were trained to administer the survey, and physicians were trained for anthropometric measurement and lung function testing using MicroDL (hand-held portable) spirometer. A standard protocol and coding system (SPCS) was developed and enforced. All teams participated in a pilot survey to learn and practice how to enforce the SPCS.

The survey was divided into three modules (instrument is available at *eph.ccs.miami.edu/Obesity*[4]): household, individual and anthropometric measurement (see Appendix 1 for the survey instrument). The household part covered number of people in the household, household structure, heating and cooking appliances, type of fuel used in cooking, duration, type and location of the residence (e.g. land-use zoning – industrial or residential), morbidity and socio-economic details. The head of the household or a senior member of the household was interviewed for this part. Household module included detailed questions on exposure to solid fuel smoke, such as the use of fuel type for cooking and heating, duration of cooking, time spent in the kitchen in last one week, and usage of exhaust fan. They were also asked whether household had a separate kitchen and appliances used for heating and cooling the home, such as heater, ceiling fan, exhaust fan, air conditioning or cooler.

The individual part included time-activity pattern (i.e. time spent at different places in daily routine), building and place characteristics, residential history over the life course, respiratory health symptoms and smoking habits. The anthropometric part was administered to all available members of the household who were ≥5 years and consented to participate in the measurements, which included measurement of height and weight along with lung function testing. Weight was measured using a digital scale, and standing height was measured using a stadiometer with a fixed vertical backboard and an adjustable headpiece.

In the section of morbidity and mortality, the respondent who answered the questions about household module, was asked about the current health status of all household members, such as "Did anyone in the household visit health center/hospital or consulted any physician during the last 3 months?" Followed by this other questions were asked to screen for other diseases, including TB. For TB, participants were asked "Has anyone in the household ever suffered from Tuberculosis?" If response was "Yes", they were asked follow up questions as: "Report age when TB was diagnosed". To further interrogate TB symptoms, two other questions were asked: "Has anyone in the household ever coughed blood? and "Was anyone's sputum ever clinically

examined?". TB cases were identified based on the responses to the above the questions. Questions concerning other risk factors, such as occupation, tobacco smoking and income were also asked. The data related to tobacco smoking was self-reported. In case subject answer 'YES' to smoking questions, follow up questions about the types and frequency of smoking were asked.

Individual module also included life time exposure to various type of cooking fuel matrix to assess cooking related exposure. Lifetime cooking matrix included type of fuel used at different ages for example <20, 20 to 30, 30 to 40, 40 to 50, 50 to 60 and > 60 years. Type of fuel was categorized into: 1) solid fuel (coal, coke, dung cake and wood), 2) gas from cylinder (LPG), 3) electric heater, 4) kerosene and 5) others.

Computation of household expenditure: Respondent-reported income data can be challenging due to under- and non-reporting of income. Therefore, we utilized household per capital monthly expenditure (in Rupees) for all categories: food items (Rice, Wheat Flour, Pulses, Sugar, Spices etc.), oily food items (vegetable oil, ghee, butter, etc.), milk, vegetables, fruits, meat (including chicken, fish and mutton), toiletries (including soap, combs, hair oil, toothpaste), children's education, phones (both cellphone and landline), bill of tap water and electricity bill. For some items expenditure was asked on a weekly bases (such as vegetables and fruits), and other monthly (such electricity bill) to reduce recall bias. For example, recalling vegetables and fruits purchased during last week (including today) should have had less recall bias than recalling items purchased asking for items purchased during the past month. For utility bills (such as water and electricity) household receive one monthly bill. Thus, we asked for monthly expenses on such items.

Instead of asking for total expenses household consumption items, respondents were ask the quantity they bought, which was then multiplied by the local market rates, published in Hindustan Times, the National English Newspaper in India. Although there must have been variations in the food items, expenditure on other items must have been constants, such as water, electricity, milk etc. Weekly expenditures were multiplied by 4 in order to estimate monthly expenditure. The sum of total expenditure was divided by the total number of members, who lived in the household at the time of the survey.

Relationship between income and household expenditure: Of the total household surveyed during 2004 and 2009, 39% (1,208) households did not report any monthly income or report very low income. However, there was a strong positive relationship (R^2 ~ 43%) between per capita monthly household expenditure and per capita monthly household income of household who reported income under any of the three questions: income for each individuals in the household (I34) from the main occupation, secondary occupation (I47) and others (H24) (Figure S1).

Both variables were highly skewed and analyzed at log scale. A t-test with Welch's approximation suggests that changes in the rates of per capital monthly household expenditure (0.5162 at natural log scale; or Rupees 799) was not significantly different (p~0.19) from the rate of change in the per capital monthly income (0.43 at natural log or Rupee 1,024) between 2004 and 2009 (Table S1).

Table S1: Results of t-test in the rates of change in the monthly per capital household expenditure and income between 2004 and 2009.

Monthly per capita household	Mean Difference (2009-2004	Standard Error	Observation	95% confidence Interval
ln(expenditure (Rupees)	0.516	0.023	3,063	0.47 – 0.56
ln(income (Rupees))	0.437	0.055	1,862	0.33 – 0.55
Difference	0.078	0.060	-	-0.38 – 0.196
t-statistics ~ 1.31 (p ~ 0.189)				

Figure S1: Relationship between self-reported per capita monthly per capital household expenditure and per capita monthly household income.
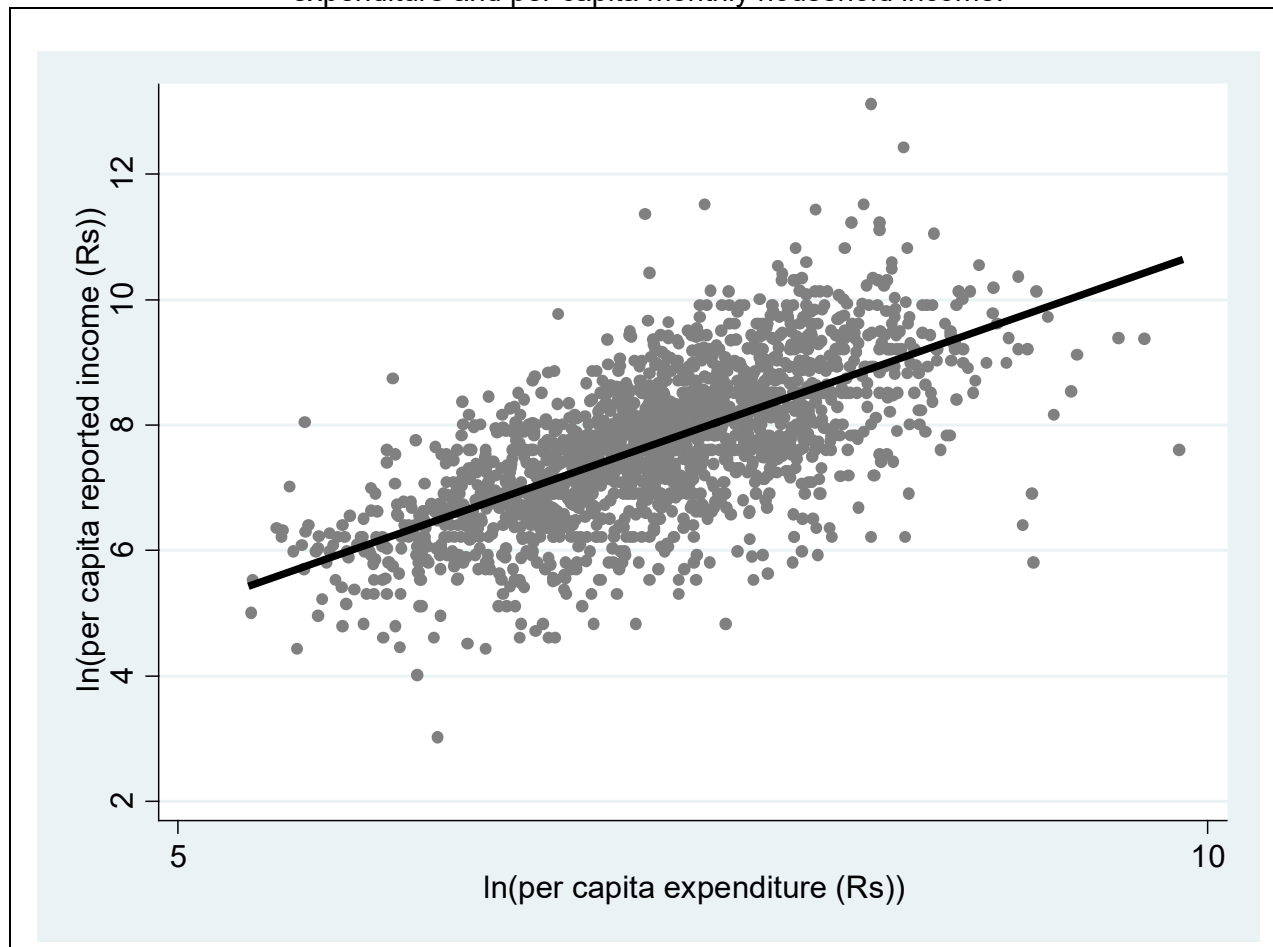

B. Smoking and Solid Fuel Exposure Interaction

Table S2: Odds of the history of active TB with respect to smoking and solid fuel exposure, and their interaction.

Variables	Cooking		Heating	
	Model - 1	Model-2	Model - 1	Model-2
Smoking (0=no, 1=yes)	3.176***		2.328***	

	Model-1		Model-2	
	(1.959 - 5.147)		(1.354 - 4.003)	
Solid fuel exposure (0=no, 1=yes)	2.238**		1.471	
	(1.201 - 4.169)		(0.796 - 2.720)	
Non-smoker x unexposed	1		1	
	(1.000 - 1.000)		(1.000 - 1.000)	
Non-smoker x exposed	1		1	
	(1.000 - 1.000)		(1.000 - 1.000)	
Smoker x unexposed	1		1	
	(1.000 - 1.000)		(1.000 - 1.000)	
Smoker x exposed	0.591	1.800**	2.707*	2.291***
	(0.169 - 2.071)	(1.085 - 2.985)	(0.974 - 7.519)	(1.507 - 3.484)
Constant	0.012***		0.012***	
	(0.009 - 0.015)		(0.010 - 0.016)	
Observations	6,623		6,600	
(robust 95% confidence interval in parenthesis); *** $p<0.01$, ** $p<0.05$, * $p<0.1$ **Model-1** included all three terms: smoking, solid fuel exposure and their interaction simultaneously. **Model-2** included only one term of interaction of solid fuel exposure and smoking.				

Figure S2. Predicted probability of the history of active TB using Model 1 (described above) by smoking and exposure status: a. solid fuel for cooking; b. solid fuel used for heating home.
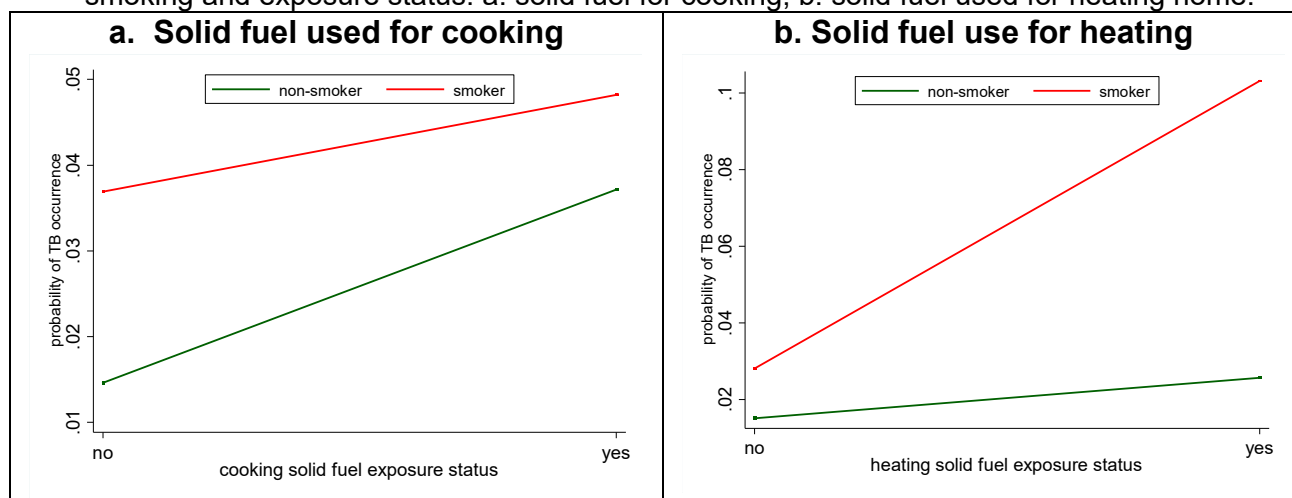
References

1. Kumar, N., *Spatial sampling design for a demographic and health survey.* Population Research and Policy Review, 2007. **26**(5-6): p. 581-599.
2. EICHER, *Delhi: City Map*. 2010, New Delhi: Eicher Goodearth Ltd.
3. ESRI, *ArcGIS, Version 10.1, Redlands*. 2014, CA: Environmental Systems Research Institute.
4. Sinha, J. and N. Kumar. *Obesity research in Delhi, India*. 2016 [cited 2016 05/08/2016]; Available from: http://eph.ccs.miami.edu/Obesity.

H1: Household Code: ~~PB~~ A104-1   **Health and Air Quality Regulation in Delhi, India**   **H2: Survey Date:** 2/2/2008

INTERVIEWER(S)   **H3: Survey Team ID:** A   **H4: GPS Code:** 117

Address:

H4_1: Neighborhood Type = (1=Residential,) 2=Industrial, 3=Mixed, 4=Commercial, 5=Slum Squatter, 6=Rural Area, 7=Others

H4_2: Proximity to the main road: 0.35 (km)

INTERVIEWEE: **H5: Name of Respondent:** Naresh K.   **H6: Head of Household:** Naresh K.

H7: Household Social Group (Caste/Religion): _____ (Hindu: 1=Upper Caste, 2=Backward Caste, 3=SC, 4=ST, 5=Muslim, 6=Sikh 7= Christian, (8=Not Known).

Household members who have been living at this residence for the past 6 months.

S.No. I1	Name I2	Sex (M/F) I3	Rel. with HOH[1] I4	Age (Years) I5	Year Since when living at this place I6	Edu. Level[2] I7	Marital status[3] I8
1	N. Kumar	M		38	2006	PG	2
2	J. Sinha	F		36	2006	PG	2
3	NEIL Kumar	M		3	2006	—	1
4	KUSH KUMAR	M		3	2006	—	1
5							
6							
7							
8							
9							
10							
11							
12							

[1]**Relation with head of household:** H=husband, W=wife, F=father, M=mother, S=son, D=daughter, DIL=daughter-in-law, SIL=son-in-law, GS=grand son, GD=grand daughter, SL=Self, O=other
[2]**Education:** I=illiterate, L=literate, P=primary, M=middle, MT=matriculation, SS=senior secondary, G=graduate, PG=postgraduate, TE=technical education, OTS=other
[3]**Marital Status:** 1=unmarried, 2=married, 3=widow, 4=divorced, 5=separated

HOUSEHOLD INFORMATION

	1	2	3	4
H8: Household Type:	Single Story	(Double Story)	> 2 Stories	Slum/Squatter

H9: Household Tenure: 1 = Rented (2 = Owned)

H10: Which best describes the building in which you live? TICK ONE BOX ONLY

a) one family house detached from any other house?	1	☒
b) one family house attached to one or more houses?	2	
c) a building for two families?	3	
d) a building for three or four families?	4	
e) a building for five or more families?	5	
f) a hut, tent or brick/tent/slum type	6	
g) other: _____	7	

H11: Since when you have been living here ___2006___ (year)

H12: Monthly rent for rented household/government quarters: ___10,000−00___ (Rs). If owned print approximate rental value.

> If unable to get this info, check in the locality and assign the rent according to the house type and the number of rooms

H13: How many times have you changed your home in the last 10 years? ___4___

H14: Number of rooms in the household including living room: ___8___   H15: Are there windows in the household for ventilation: (1 = Yes)   2=No

Does your household have any of the following?

	1=Yes	2=No
H15_1 Ceiling fan	☒	
H15_2 Exhaust fan	☒	
H15_3 Air conditioning	☒	
H15_4 Cooler	☒	☒

Heating and Cooking

Which of the following appliances do you use for heating the house in winter?

	1=Yes	2=No
H16_1: open coal, coke or wood fire		
H16_2: electric heater	☒	
H16_3: Others		

H17: Is there a separate kitchen in the household?   (1= Yes)   2= No

If answer is yes, ask **H17_1**, otherwise go to question number **H18**

H17_1 Is there an exhaust fan in the kitchen?   (1= Yes)   2= No

2

H18: What kind of stove do you *mostly* use for cooking? TICK ONE BOX ONLY
    1. coal, coke or wood (solid fuel)?
    2. gas (gas from cylinder)
    (3. electric?) — main
    4. kerosene?
    (5. microwave) — secondary
    6. other: _____

H19: Is there any **road/street** within a distance of 200 meters from your house? (1= Yes 2= No)
If yes, ask question **H19_1** and **H19_2**
    H19_1 How often do **scooters/motorcycles/cars/three-wheelers** pass on the **street/road** next to/in front of your house? TICK ONE BOX ONLY
        a) 1-2 a day   1
        (b) 1-2 hour)   2
        c) 1-2 every minute   3
        d) 2-4 every minute   4
        e) 4-10 every minute   5
        f) More than 10 every minute   6
        g) Others   7

    H19_2 How often do **heavy vehicles (e.g. trucks/buses)** pass on the street/road next to/in front of your house?   TICK ONE BOX ONLY
        a) 1-2 a day   1
        b) 1-2 hour   2
        c) 1-2 every minute   3
        d) 2-4 every minute   4
        e) 4-10 every minute   5
        f) More than 10 every minute   6
        (g) Others)   7

Morbidity and Mortality
H20: Has any one in the household visited any health center /hospital/medical or consulted any doctor/physician uring the last 3 months?
(1 = Yes)   2= No
IF YES, answer the **H20_1** and **I9** through **I15** in the morbidity matrix for each patient on the next page.
H20_1: How many people suffered any illness during the past 3 months? _____ (Inter)

Morbidity Matrix

S. No. as in I1	Disease/ Symptoms I9	Clinic/hospital/health center		No of Visits / Consultations I12	Total Expenses (Rs) I13	Out-come* I14	No of days could not work or go to school/college due to illness (I15)	Remark if any
		Govt/Private I10	Distance (km) I11					
4	Flu	Private	5	1	2000	C	2	

Code for I14: C=Cure, U=Still Under Treatment, N=Not Cured, O=Others

H20_2: Has anyone in the household ever suffered from Tuberculosis?   1 = Yes   (2= No)
    H20_21 If response is **Yes** write the I1 _____, **H20_22**: Age when TB was reported_____(Years)

H20_6: Has any one in the household ever **coughed blood**?   1 = Yes   (2= No)
    H20_61 If response is Yes write the I1 _____, **H20_62**: Age when it happened_____(Years)

H20_7: Has the sputum of any one in the household ever been clinically examined?   (1 = Yes)   2= No
    H20_71 If response is Yes write the I1 _____1_____, **H20_72**: Age when it was examined____25____(Years)

H20_3: Has any child in the household suffered from pneumonia (high fever, rapid breathing and cough) during the past 5 years?   (1 = Yes)   2= No
    H20_31: If Yes write the I1_____4_____(if more than one separate them by comma)

H20_4: Has any one in the household suffered from Cataract?   1 = Yes   (2= No)
    H20_41: If response is **Yes** write I1 _____ (if more than one separate them by comma)

H20_5: Has any one in the household been diagnosed of lung cancer?   1 = Yes   (2= No)
    H20_51: If response is **Yes** write I1 _____ (if more than one separate them by comma)

H21: Has there been any death in the last one year?   1 = Yes   2= No   **NOTE:** Ask this question in the last.

If answer is yes, write details in the table

Relationship with HH H21_1	Age H21_2	Death Type H21_3*	If due to Illness, disease symptoms H21_4

Code for H21_3: 1=Natural, 2=Illness, 3=Accidental, 4=Others

Travel information

Has any one in the household traveled at least 1 kilometer/day (for any purpose including social, economic, education or job) during the last 30 days?
IF YES, fill the travel matrix of each individual's travel details

S No. As in I1	No of visits in the last 30 days I16	Place visited (at least more than 1km away from home) I17	Total Distance Traveled (km) in the last 30 days I18	Purpose of visit[10] I19	Mode of transport[11] I20	Mask Used 1=Yes, 2=No I21
1	5 × 4		6 × 2·3 × 4 × 2	1	C	2
2	5 × 4		6 × 2·3 × 4 × 2	1	C	2
3	5 × 4		5 × 2·3 × 4 × 2	3	C	2
4	5 × 4		5 × 2·3 × 4 × 2	3	C	2

[10] 1=Job, 2=Shopping, 3=Attending School/College/University, 4=Social Visit, 5=Business, 6=Others
[11] **Mode of transportation:** W=Walking, Y=Bicycle, S=Scooter/Motorcycle, R=Rail, B=Bus, C=Car/Jeep/SUV, O=Others

Economic Base of the Household

H22 Which is the main source of income of the household? (1=Govt Job), 2=Private Job in small business, 3=Private Job in LTD or MNC, 4=Small Business such as shop
4=Large Business (such as big retail or wholesale), 5=Industrialist, 6 = Manual Labor, 7=Others

H23 How many people contribute towards income of household? ___2___

Main occupation description of the persons working at least for the past three months.

S. No. as in I1	Employer* I22_A	Occupation I22_B**	Since (year) I23	Place of work I24	Distance (km) I25	Mode of Travel[11] I26	Daily Traveling Time (Hours) I27	Daily Travel Expenditure (Rs) I28	No of Hours at Work Place/Day		Is the workplace air conditioned I31	Income		
									Inside I29	Outside I30		No of Work Days I32	Wage (Rs.) I33	Monthly (Rs) I34
1	G	1	1994				0.15	200	6	0	YES			4000
2	G	1	2000				0.15	200	8	0	YES			4000

Code for I22_A: * G=Govt. Job, PS=Private Job in small business, PL=Private Job in LTD or MNC, BS=Own small Business, BL=Own Large Business (such as big retail/wholesale), IND=Own Industry, AG =Landlord/Agriculturist, OTS=Others.

    ** Code for I22_B:

    1=Higher Professional (e.g Doctor, engineer, lecturer, lawyer etc.)   7=Skilled Worker (foreman, motor mechanic, printer, tailor, electrician)
    2=Higher Admin (e.g. business exec, high class Govt. officials)   8=Semi-Skilled worker (Bus driver, carpenter, metal worker),
    3=Technical and lower professional (nurse, artist, primary teacher, lab tech)   9=Unskilled worker(laborer, porter, unskilled factory worker)
    4=Clerical (secretary, clerk etc)   10=Farm Owner
    5=Sales(sales manger, shop owner, shop assistant, insurance agent)   11=Farm Laborer
    6=Service (restaurant owner, policeman, waitress, barber, janitor)   12=Home Duties (not working for pay)
    13=Going to school, college or University.

Subsidiary occupation description of the persons working at least for the past three months; Use the same codes as above.

S. No. I1	Employer* I35_A	Occupation I35_B**	Since (year) I36	Place of work I37	Distance (km) I38	Mode of Travel I39	Daily Traveling Time (Hours) I40	Daily Travel Expenditure (Rs) I41	No of Hours at Work Place/Daily		Is the workplace air conditioned I44	Income		
									Inside I42	Outside I43		No of Work days I45	Wage (Rs) I46	Monthly (Rs) I47

H24: Income from other sources such as rent, pension etc. _____ 0 _____ (Rs)

Household Assets:

Item	0=No, 1= Yes	How Many	Approx Unit Value (Rs.)
H25_1. Television B&w	0		
H25_2. Television color	1	3	
H25_3. Scooter/Motorcycle	0		
H25_4. 3 Wheeler (auto rikshaw)	0		
H25_5. Car or any other 4 wheeler	1	2	
H25_6 Cooler	0		
H25_7. Air Conditioner	1	1	
H25_8. Residential Property Owned	0 1	1	
H25_9. Commercial Property Owned	0	0	
H25_10. Other large assets	0	0	

If engaged in business/industry etc. then ask the following

H25_11: Estimated assets: _____ 0 _____ (Rs)

H25_12: Number of people working in the business from the household: _____ 0 _____ H25_13: Number of people employed from outside: _____ 0 _____

H25_14: Average salary of each person employed from outside: _____ 0 _____ (Rs)

Expenditure module

Item	Monthly/Weekly expenditure (Rs) (if weekly multiply by 4)
H26_1: Monthly Expenditure on staple food items – Rice, Wheat Flour, Pulses, Sugar, Spices etc.	500 X 4
H26_2: Monthly expenditure on vegetable oil, ghee, butter etc.	150 X 4
H26_3: Monthly expenditure on milk	20 X 2 X 30
H26_4: Weekly expenditure on Vegetables	15 X 1 X 30
H26_5: Weekly expenditure on fruits	20 X 4 X 4
H26_6: Weekly expenditure on Meat (Chicken, Fish, Mutton)	0
H26_7: Monthly expenditure on Toiletries (soap, combs, hair oil, tooth paste etc.)	300 X 1
H26_8: Monthly expenditure on children's education (tuition fee, office supply and pocket money) etc.	1400 X 1 X 2
H26_9: Month expenditure on all phone lines including cell phone (enquire about the last month bill)	1600 X 1
H26_10: Monthly expenditure on tap water supply (enquire about the last month bill)	400 X 1
H26_11: Monthly expenditure on electricity (enquire about the last month bill)	800 X 1

Respiratory health questionnaire for each individual 15 years or older

S.No. as in **I1** in the household questionnaire: _____1_____   Name: _Naresh Kumar_

Exposure Module: Spatial location module

6 to 7 AM				7 AM to 8 AM				8AM to 9.00 AM				9 AM to 12 Noon				12 Noon to 4 PM							
6.15	6.30	6.45	7.00	7.15	7.30	7.45	8.00	8.15	8.30	8.45	9.00	9	10	11	12	1.00		2.00		3.00		4.00	
I50	I51	I52	I53	I54	I55	I56	I57	I58	I59	I60	I61	I62	I63	I64	I65	I66	I67	I68	I69	I70	I71	I72	I73

IH   TC   IOACP   TC   IH

4 to 5 PM				5 PM to 6 PM				6PM to 7.00 PM				7 PM to 8 PM				8 PM to 6AM							
4.15	4.30	4.45	5.00	5.15	5.30	5.45	6.00	6.15	6.30	6.45	7.00	7.15	7.30	7.45	8.00	8-10PM		10-12		12-4AM		4-6 AM	
I74	I75	I76	I77	I78	I79	I80	I81	I82	I83	I84	I85	I86	I87	I88	I89	I90	I91	I92	I93	I94	I95	I96	I97

Location Codes: Note - Write address wherever P is suffixed for indoor and outdoor locations in the space between above two matrices

Indoor

IH=Inside Household
IOP=Inside office non AC
IOACP=Inside Office AC
ISP=Inside others e.g. school, college
ISACP=Inside others AC e.g. school, college

Outdoor

OH = Outside Household ± 1km
OP = Outdoor other than household e.g. play ground, sitting in a lawn, shopping outdoor.

Travel Related

TW=Walking ,
TS=Scooter/Motorcycle
TB=Bus
TO=Others

TY=Bicycle
TR=Rail
TC=Car/Jeep/SUV

If person moves in-out building use IN_OUT

I98: Year since when you have been following this schedule? _____2005_____

Location histories:

Where did you live before the	Place Name (distance from the present location km) I99	Place Type I100*	Duration (Years) I101	Job/Occupation I102**	Did you commute? Yes=1, No=2 I103	If Yes in I103 mode of Commuting*** I104
A. Present Address	Delhi	1	3	1	1	C
B. Before A	Delhi (2km)	1	1	1	1	C
C. Before B	Delhi (15km)	1	8	1	2	—
D. Before C	Rohtak (75km) 2	2	26	13	1	Y
E. Before D						

* Code for I100: 1=Delhi, 2=Other City, 3=Sub Urban of Delhi, 4=Town, 5=Sub Urban of the Town, 6=Rural Areas, 7=Others

** Code for I102:

1=Higher Professional (e.g Doctor, engineer, lecturer, lawyer etc.)
2=Higher Admin (e.g. business exec, high class Govt. officials)
3=Technical and lower professional (nurse, artist, primary teacher, lab tech)
4=Clerical (secretary, clerk etc)
5=Sales(sales manger, shop owner, shop assistant, insurance agent)
6=Service (restaurant owner, policeman, waitress, barber, janitor)
13=Going to school, college or University.

7=Skilled Worker (foreman, motor mechanic, printer, tailor, electrician)
8=Semi-Skilled worker (Bus driver, carpenter, metal worker),
9=Unskilled worker (laborer, porter, unskilled factory worker)
10=Farm Owner
11=Farm Laborer
12=Home Duties (not working for pay)

*** Code for I104: W=Walking, Y=Bicycle, S=Scooter/Motorcycle, R=Rail, B=Bus, C=Car/Jeep/SUV, O=Others

Cooking Related Exposure: Life Time Cooking Matrix

Type of	When you were (Years)					
	< 20 Years I105	20 to 30 I106	30 to 40 I107	40 to 50 I108	50 to 60 I109	➢ 60 years ➢ I110
Fuel Used	2	2	3			

1=Solid Fuel (Coal, Coke, Dung Cake, Wood), 2=Gas from Cylinder (LPG), 3=Electric Heater, 4=Kerosene, 5=Others

I111: How many days a week do you spend more than 15 minutes on cooking (food)? _____7_____ (days)
     If answer is not 0, ask question **I112** through **I116**

     I112: *On average* how long have you spent cooking with your stove each day in the last one week? ____0.5____ (Hours)

     I113: *Over the last week* when you were cooking did you have a door or window to the outside air open TICK ONE BOX ONLY
         a. most of the time   ☐ 1
         b. some of time   ☐ 2
         c. rarely (or only occasionally)   ☐ 3
         d. I do not have a door or window that opens to the outside in my kitchen   ☒ 4

     I114: Do you have an extractor fan over the cooker?   (1=Yes, 2=No)

     I115: When cooking, do you use the fan   TICK ONE BOX ONLY
         a) all of the time?   ☒ 1
         b) some of the time?   ☐ 2
         c) none of the time?   ☐ 3
         d) not applicable   ☐ 4

     I116: Does the fan take the fumes outside the house?   (1= YES   2= NO)

I117: How do you describe your smoking habit?
     a.   Never Smoked
     b.   Smoked at least 100 cigarettes/biris, but has giving up smoking
     c.   Smoker, means smoke these days
If response is c. ask question **I118_A** and **I118_B**

     I118_A What do you smoke? 1=Cigarette   2=Biri   3= Both   4= Hukka
     I118_B How many Cigarette and/or biris (together) do you smoke in a day? _____ (Number)

Air Quality Awareness Module
I119 Do think that the air pollution levels are high in your locality or on the roads you travel or at the place you work?   (1= YES   2= NO)
     If answer is yes, ask questions **I119_A** through **I119_C**.
     I119_A: Who do you think is responsible for high levels of air pollution? _Vehicles ~~from~~ industries_

     I119_B: Do you think that the air pollution levels can be reduced?   (1= YES   2= NO)

I119_C If answer is Yes, how?__ *Better technology & reduction in the # of vehicles*

I120: Do you know if there are any sources of pollution in your neighborhood?   (1= YES) 2= NO
   I120_A: What is the type of air pollution?
      (1= Vehicles)   2= Thermal Plant(s)   3= Cooking   (4=Industry)   5= Others

   I120_B: How far is this pollution source from your house? ____ *0.75* ____ (km)

I121: Do you think the air quality in Delhi has improved after CNG regulation?   (1= YES) 2= NO

I122: Has any industry in your locality/neighborhood shut down during the last two years?   (1= YES) 2= NO
   If response to I122 is yes, then ask I122_A
   I122_A: Why did this shut down?   1= Due to high pollution level, (2=Others)   *DDA regulation*

I123: Do you think that the high levels of air pollution have some effect on human health?   (1= YES) 2= NO
   If response is Yes, ask I123_A and I123_B
   I123_A: What type of disease(s) do you think it can cause? __ *Asthma, lung cancer, heart attack*

   I123_B: What can be done to prevent these diseases? __ *Clean air by reducing air pollution*

I123_C: If we assume that the air pollution cause respiratory diseases including flu, eye nose allergies, asthma etc. Like we pay for clean water, would you be willing to pay for the cost of clean air to avoid any of the related diseases? 1= (YES) 2= NO

   I123_D If YES how much can you afford to pay for the clean air like you pay for tap water or electricity?

   1= Less than Rs. 5
   2= 5 to 10
   3= 10 to 20
   4= 20 to 40
   5= 40 to 100
   6= 100 to 250
   7= 250 to 500
   8= More than 500
   (9=Yes, but not precise)

Respiratory Health Module

I124: Have you had wheezing or whistling in your chest at any time in the last *3 months*?   1= YES   2= NO

> *IF 'NO' GO TO QUESTION I125, IF 'YES':*
>
> **I124_A:** Have you been at all breathless when the wheezing noise was present?   1= YES   2= NO
>
> **I124_B:** Have you had this wheezing or whistling when you did *not* have a cold?   1= YES   2= NO

I125: Have you woken up with a feeling of tightness in your chest at any time in the last *3 months*?   1= YES   2= NO

I126: Have you had an attack of shortness of breath that came on during the day when you were at rest at any time in the last *3 months*?   1= YES   2= NO

I127: Have you had an attack of shortness of breath that came on *following* strenuous activity at any time in the last *3 months*?   1= YES   2= NO

I129: Have you been woken by an attack of coughing at any time *in the last 3 months*?   1= YES   2= NO

I130: Do you *usually* cough first thing in the morning in the winter?   1= YES   2= NO

I131: Do you *usually* cough during the day, or at night, in the winter?   1= YES   2= NO

> If response is yes ask **I131_A** and **I131_B**
>
> **I131_A:** Do you *usually* bring up any phlegm from your chest first thing in the morning in the winter?   1= YES   2= NO
>
> **I131_B:** Do you *usually* bring up any phlegm from your chest during the day, or at night, in the winter?   1= YES   2= NO

I132: Do you ever have trouble with your breathing?   1= YES   2= NO

IF 'NO' GO TO QUESTION I134, IF 'YES':

<div align="center">TICK ONE BOX ONLY</div>

> **I132_A:** Do you have this trouble
> a) continuously so that your breathing is never quite right?   1
> b) repeatedly, but it always gets completely better?   2
> c) only rarely?   3

I134: Has a doctor ever confirmed that you suffer from Asthma?   1= YES   2= NO

IF 'NO' GO TO QUESTION I135, IF 'YES':   1= YES   2= NO

> YEARS
>
> **I134_A:** How old were you when you had your first attack of asthma?   [   ]
>
> YEARS
>
> **I134_B:** How old were you when you had your most recent attack of asthma?   [   ]

I134_C: How many attacks of asthma have you had in the last *3 months*? _____

I134_D: Which months of the year do you usually have attacks of asthma?
  1. January / February
  2. March / April
  3. May June
  4. July / August
  5. September / October
  6. November / December

I134_H: Are you currently taking any medicines including inhalers, aerosols or tablets for asthma?   NO   (YES)

I134_I: Do you have written instructions from your doctor on how to manage your asthma if it gets worse or if you have an attack?   (NO)   YES

I135: Do you have any nasal allergies? (1= YES) 2= NO
IF NO GO TO I136, IF YES
    I135_A: How old were you when you first had nasal allergy? _20_ Years

I136: Have you ever had a problem with sneezing, or a runny or a blocked nose when you did not have a cold or the flu? 1= YES 2= NO
Allergy Module

Does any of the following happen	When in contact with or near to			
	Animals-Dog, Cat, Horse I137	Dusty part in the house Or pillow or duvet I138	Smoke I139	Trees, Grass flowers or lots of pollen I140
A. Start to cough?				
B. Start to sneeze or get a running nose		)	)	/
C. Get itchy or watering eyes		\	/	/

1=Yes 2=No

I141: About how many books were there around your family's house when you were 14/15/16 years of old?
    1 = None   5 = Around 100
    2 = 1 or 2   6 = Around 200
    3 = Around 20   7 = Around 500
    (4 = Around 50)   8 = Around 1000 or More

Needed for every individual 5 years or older

Individual ID as in I1_____1_____   Name:___Naresh K.___

I142: While performing spirometery record MicorDL ID:_____X_____

I143: Height:_____72"_____ (Inches)

I144: Weight: _____80_____(kg)

Spirometery Readings

Trial Number	PEF I145A	FEV$_1$ I145_B	FVC I145_C
1.	672	3·56	3·64
2.	680	3·84	3·94
3.	630	4·01	4·25
Best	680	4·01	4·25