

Indoor Air Quality

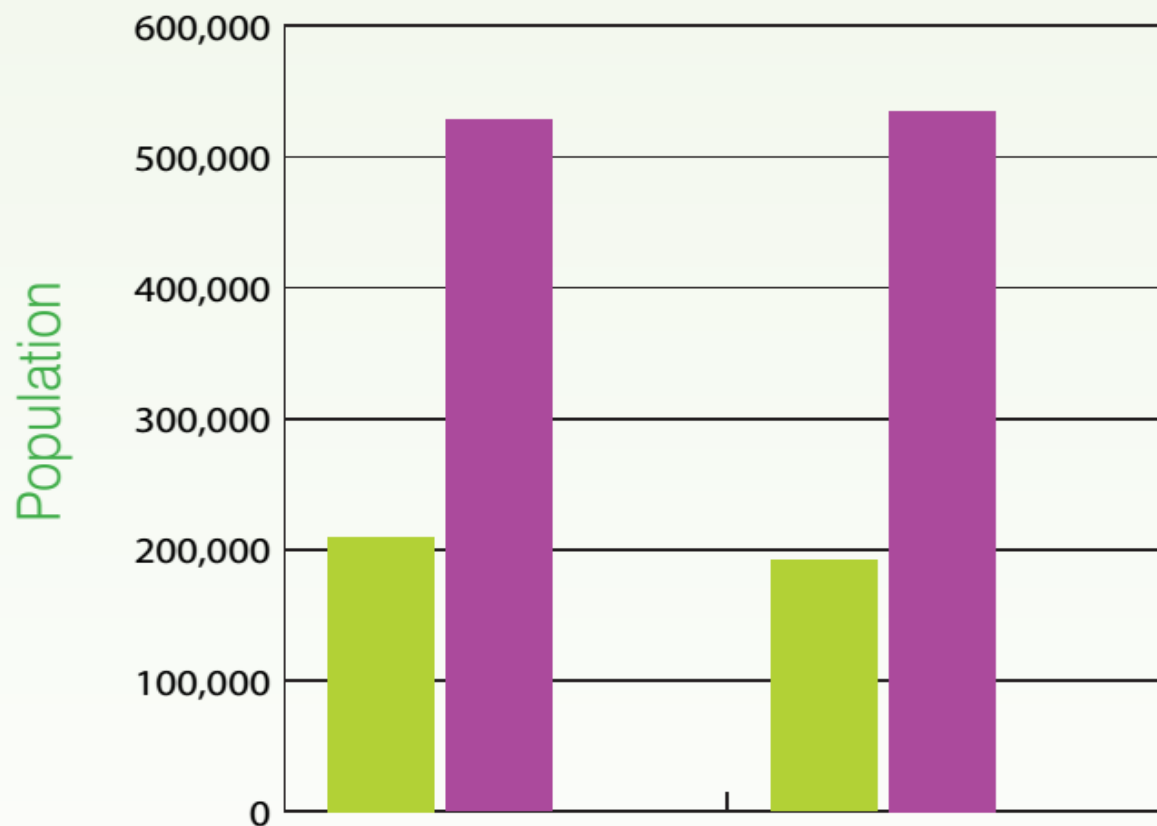
PAHO/WHO Guyana
16-18 June 2015



Situation Analysis

- Population approximately 750,000 with more than 80% of the people residing in urban and rural communities along the coastal plain
- Hinterland areas are home to about 200 Amerindian communities representing about 9.3 % of the country's population
- The majority of the residents use wood as fuel for cooking, and for lighting in some cases. Candles and kerosene lamps are also common light sources

Urban and Rural Distribution Guyana: 2002 - 2012



	2002	%	2012	%
Urban	209,992	28.4	191,810	26.4
Rural	528,323	71.6	535,193	73.6

Acute Respiratory Infection (ARI) symptoms

2014

MICS Indicator	Indicator	Description	Value
-	Children with ARI symptoms	Percentage of children under age 5 with ARI symptoms in the last 2 weeks	2.2
3.13	Care-seeking for children with ARI symptoms	Percentage of children under age 5 with ARI symptoms in the last 2 weeks for whom advice or treatment was sought from a health facility or provider	83.6
3.14	Antibiotic treatment for children with ARI symptoms	Percentage of children under age 5 with ARI symptoms in the last 2 weeks who received antibiotics	30.9

Housing characteristics 2014

Percentage of households with

- Electricity	86.9
- Finished floor	81.2
- Finished roofing	97.0
- Finished walls	93.2
Mean number of persons per room used for sleeping	1.87

Solid Fuel Use

MICS Indicator	Indicator	Description	Value
3.15	Use of solid fuels for cooking	Percentage of household members in households that use solid fuels as the primary source of domestic energy to cook	6.9

Tobacco Use

MICS Indicator	Indicator	Description	Value
12.1	Tobacco use	Percentage of people age 15-49 years who smoked cigarettes, or used smoked or smokeless tobacco products at any time during the last one month	
		(a) Women	2.1
		(b) Men	20.7
12.2	Smoking before age 15	Percentage of people age 15-49 years who smoked a whole cigarette before age 15	
		(a) Women	1.7
		(b) Men	9.4

Energy Efficient Wood Stoves

- 2013 - 507 solar cooking stoves, construction and demonstration of 15 energy efficient wood stoves and installation of 2 bio-digesters in 7 communities in regions 1,7, 8 and 9
- 2015 - 50 forced-draft prefabricated energy efficient stoves (designed by the Energy Research Institute of India) to five communities in regions 1 and 2
- 4 Energy Efficient Institutional Wood Stoves to 3 schools in Region 8

Energy Efficient Wood Stoves

Clay, clay bricks and banana sucker were used to construct energy efficient wood stoves (fireside)



Energy Efficient Wood Stove

Results:

- consumed 78% less firewood than the Existing stove
- had a 27% reduction (7 mins) in cooking time versus the existing stove
- level of smoke in the kitchen was dramatically reduced



Biodigester Construction

The biodigesters built in these two communities were constructed using low-cost tubular polyethylene plastic.



FUEL

TOTAL VOLUME OF IMPORTED PETROLEUM PRODUCTS

	2012	2013	2014
	Barrels	Barrels	Barrels
Gasoline	1,150,143	1,110,801	1,174,006
Diesel	2,084,738	1,933,954	2,139,198
Domestic Kerosene	88,560	79,798	86,930
Fuel oil	1,220,694	1,325,115	1,257,255
L.P.G. (Cooking gas)	169,892	183,786	201,497
TOTAL	4,714,027	4,633,454	4,858,885

ENERGY CONSUMPTION BY PRODUCT

	2012	2013	2014
	Barrels	Barrels	Barrels
Gasoline	1,140,119	1,150,201	1,214,868
Diesel	2,085,172	1,968,022	2,110,143
Domestic Kerosene	91,122	85,302	77,309
Fuel oil	1,190,973	1,275,935	1,258,669
L.P.G. (Cooking gas)	180,565	194,298	197,121
TOTAL	4,687,950	4,673,758	4,858,109

ELECTRICITY

- electricity sector in Guyana is a monopoly
- electricity supply is very low, linked both to technical and institutional deficiencies in the sector, with total losses close to 40% and commercial losses of about 30%
- low reliability has led most firms to install their own diesel generators, which in turn leads to higher than average electricity costs

Electricity 2015

<i>Category</i>	<i>Tariffs</i>	<i>Current rate US\$</i>	<i>10% Fuel Rebate amt US\$</i>	<i>New Net Tariff US\$</i>
Non-Govt				
Residential	A>75kWh	0.24	0.02	0.21
Residential	A<75kWh	0.26	0.03	0.24
Commercial	B	0.34	0.03	0.31
Industrial	C	0.31	0.03	0.28
Industrial	D	0.29	0.03	0.26
Industrial	E	0.26	0.03	0.23
Govt				
Residential	GA>75kWh	0.28	0.03	0.26
Residential	GA<75kWh	0.29	0.03	0.26
Commercial	GB	0.35	0.04	0.32
Industrial	GC	0.32	0.03	0.29
Industrial	GD	0.31	0.03	0.28
Industrial	GE	0.27	0.03	0.24

Next Steps

- GEA, with the Ministry of Education and the Indigenous People's Affairs will be targeting more residential type hinterland schools to replicate this intervention
- GEA will continue to carry out research into all sources of energy including those presently used
- Periodic follow-up to be carried out to encourage and ensure effective integration of the wood stoves to other residents within the community

Challenges

- remoteness of villages making the extension of existing electricity grids not feasible
- low, dispersed population and the low demand for electricity
- higher specific cost for hinterland electrification which is often difficult to justify from a strictly economic perspective when the benefits will be mostly intangible
- high transportation cost to provide modern fuels such as LPG, kerosene, gasoline and diesel and
- the low spending power of the population

Why is it so hard?

- What we know works, but gas and electricity (piped water/flush toilets), not “affordable” by the poor.
- Other technologies difficult and less effective and insufficient profits for private sector to enter
- Particularly difficult because of the high component of behavioral change required
- Easy unhealthy alternatives available – gathered biomass (and open defecation)
- Yet, the fact that 60% of the world is now protected, gives us reason to think we can protect the other 40%

