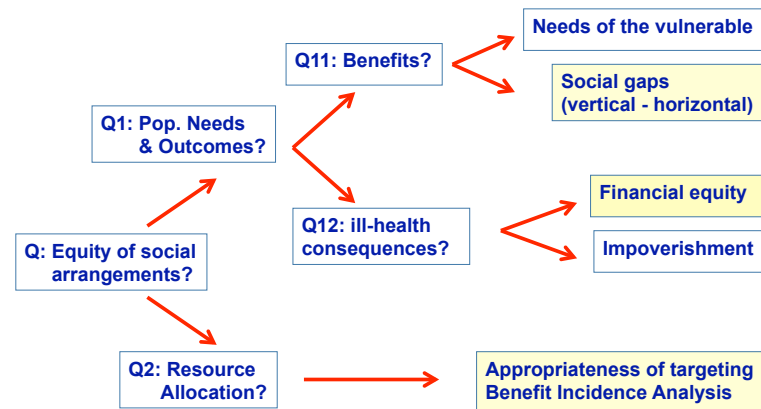


Equity analysis: social gaps

Vertical & Horizontal equity
 Concentration curve dominance
 Progressivity - redistribution
 Regression approach

Equity analysis in PH Intervention Research: A framework

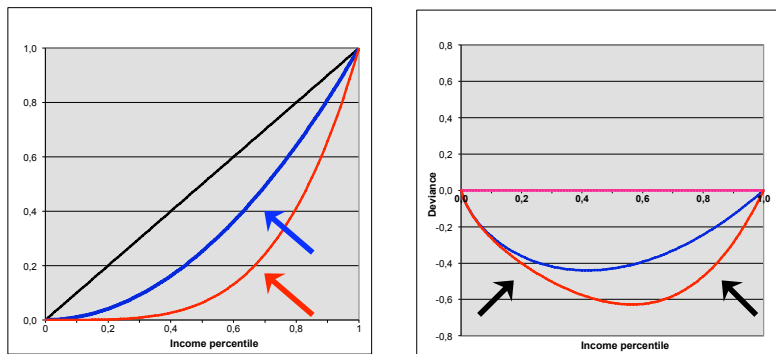


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Horizontal equity

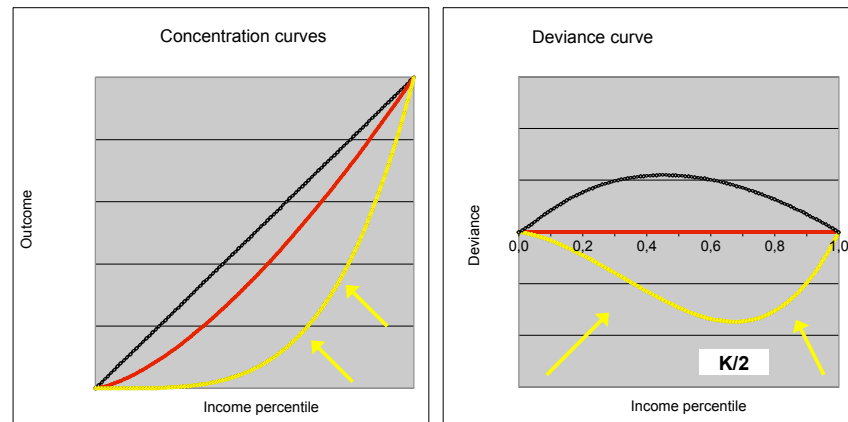
Obj = $\text{Min} (G_i = L(p)_i - p)$ in each stratum (of equal needs)



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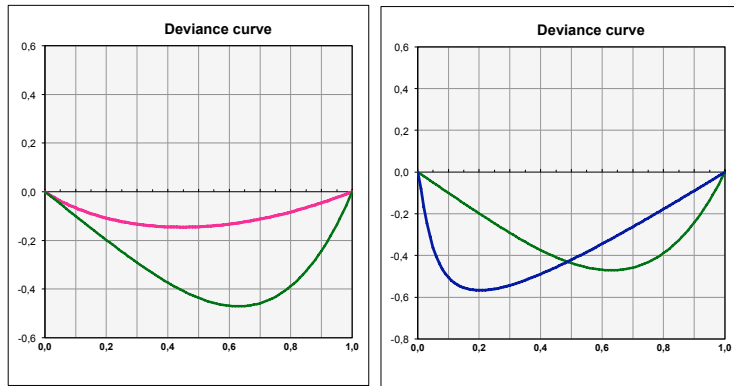
Vertical equity: (1) reducing social gradient over time

$F = \text{Min} (C - C^*)$



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Vertical equity: concentration curve dominance



5

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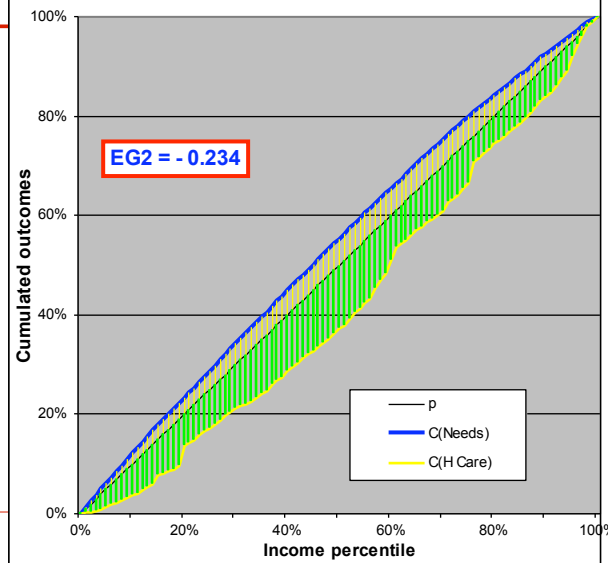
Testing concentration curve dominance

- Is the dominance statistically significant?
 - Sample variations
 - Decision rules
 - at least one significant difference between curves in one direction and not in another (corrected for multiple testing).
 - Significant differences at all quantile points (v. strict)
 - Number of comparison points
 - often 19 points (interval: $p = 0.05$)
- Software: DAD

6

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Equity Gaps in Kottathara Panchayat (2003)- (2) Health Needs - Health Consumption



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Vertical equity: (2) departures from proportionality

- Extent to which a social arrangement (T) departs from proportionality.
 - Applications: Taxation, HC payment
 - Can be extended to consumption, participation.

$$\text{KIR} = \text{Payment concentration} - \text{Income share}$$

$$\text{KIR} = \mathbf{C_T} - \mathbf{G_x} \quad / \quad K \approx N(0, \sigma^2)$$

- May reflect the progressivity of current social arrangements (If $H=0$, $RE=0$)

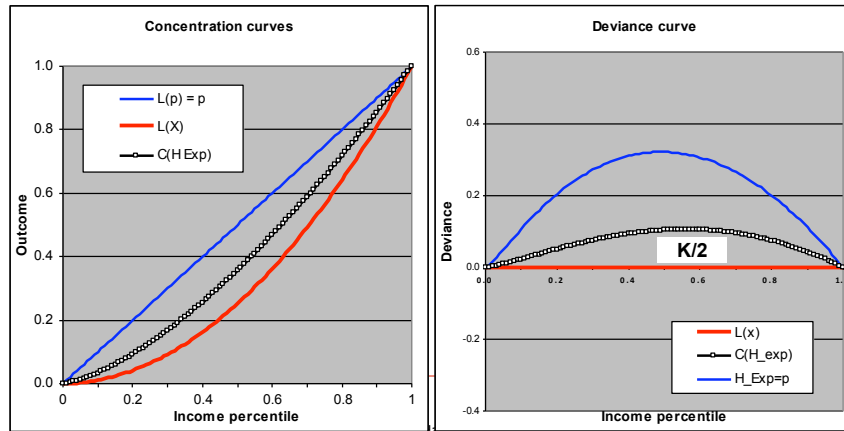
8

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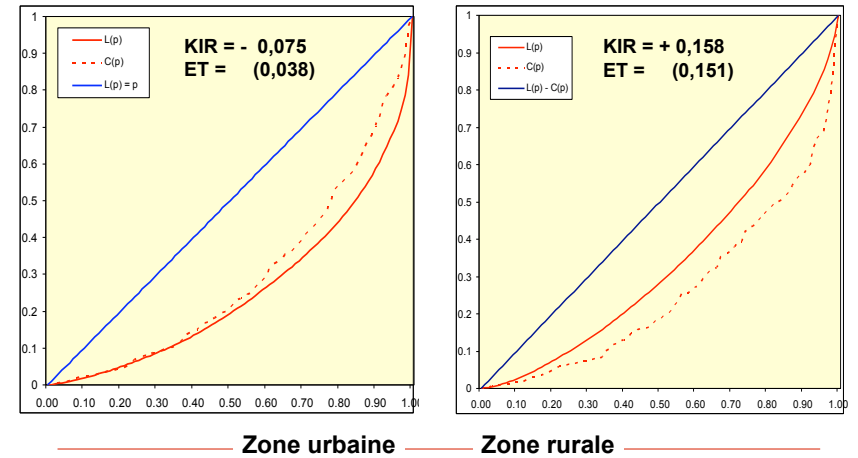
Example: Burden of health care costs

$$F: K = (C_{XH} - L_X) > 0 \quad / \quad L_X = \text{income distribution}$$

Is the financing mechanism progressive / regressive?



Example: Progressivity of health care expenditures in Burkina Faso (MAPHealth study)



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Distributive effects: summary of results

	Income	Health Exp.	Distributive effects		Residual
	Measure	PEqA	(M)	(SE)	Income
	GI	CC			CC
All	0.558	0.571	0.023	-0.029	0.559
Bobo-Urban	0.535	0.443	-0.077	0.038	0.529
Nouna_1/2Urban	0.573	0.738	0.178	-0.048	0.590
Nouna_Rural	0.396	0.550	0.117	-0.048	0.403
Bazega_1/2Urban	0.479	0.574	-0.001	-0.065	0.490
Bazega_rural	0.356	0.520	0.158	-0.052	0.371
HC < 5km	0.521	0.510	-0.011	-0.033	0.522
HC > 5km	0.358	0.497	0.139	-0.046	0.348

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Progressivity and redistribution

Redistributive effect of health financing

Redistribution (taxation – health care financing)

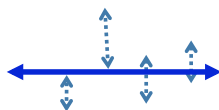
- Vertical redistribution (between strata)



- Horizontal inequality (within strata)

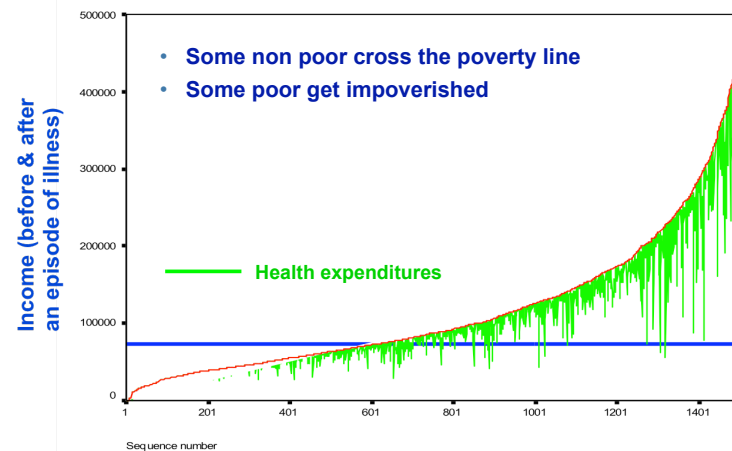


- Reranking



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Illness, health expenditures and impoverishment in Burkina Faso



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Redistribution effect

- Definition: reduction in the Gini coefficient

$$\begin{aligned} RE &= G_{X-T} - C_{X-T} \\ &= \text{Postpaym. ineq.} - \text{Postpaym. conc. Index} \end{aligned}$$

- ARL Decomposition:

- Progressivity of the HC financing system
- Proportion of income going to finance health care
- Degree of horizontal inequality raised (H)
- Extent of any re-ranking among households (R)

$$RE = V - E - R$$

17

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Regression

community intervention to increase access to PHC services in Dori, Burkina Faso.

25

Design

- Intervention:
 - Free care for children, pregnant women (2009)
- Interrupted time series (ITS) analysis
 - all health centers of 4 Districts, 78 Communities, 96-month
 - stratified random sample of health centres
 - intervention district (12) & non-intervention district (6).
 - 56-month pre-intervention ; 12-month period of intervention.
- Panel survey of 1,214 households
 - one of the two districts exposed to the intervention (Dori).
 - waves: 2008 (M-1), 2009 (M11), 2012

26

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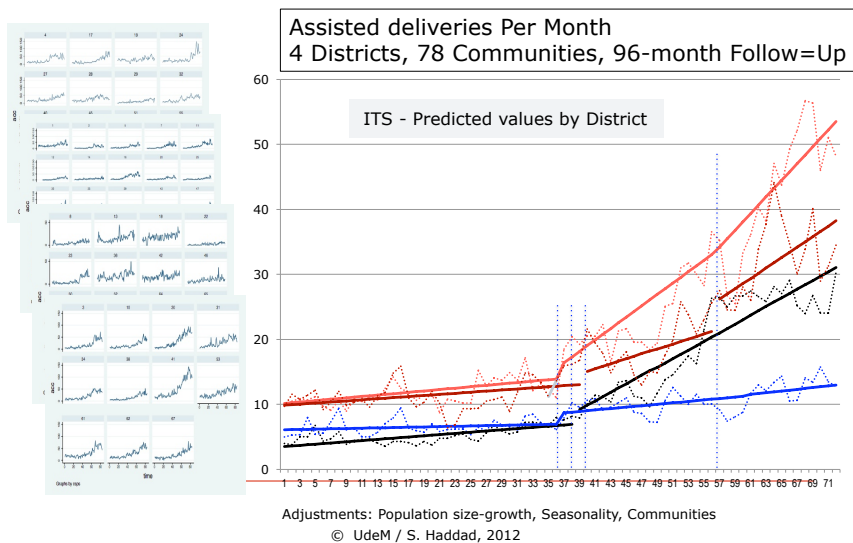
Interrupted time series

- Administrative records
- Efficient
- Versatile (counterfactuals):
 - Single – multiple series (intervention sites)
 - With – without (comparative)
 - Non-equivalent dependent variables
- Powerful
 - Random effects models
 - Pooled series

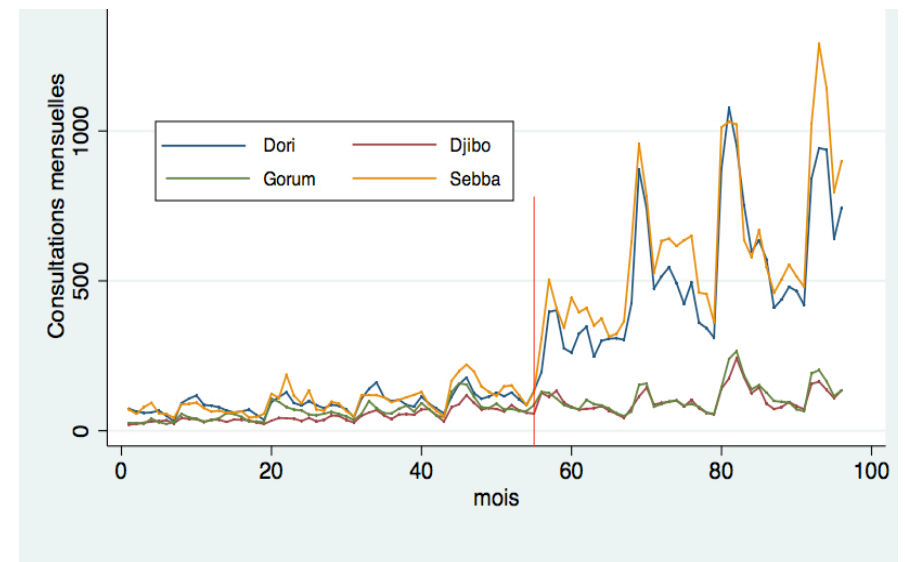
27

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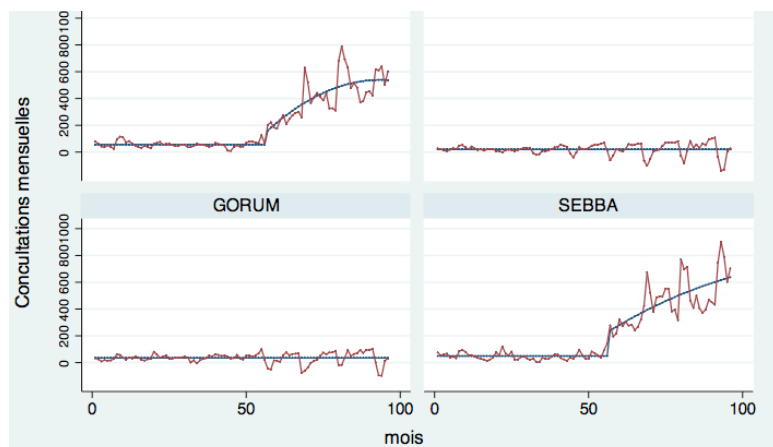
Pooled Time Series + Multilevel Analysis: Impact of 2 consecutive interventions in Dori (Burkina Faso)



Evolution of the number of consultations per month in health centres (children 0-5)



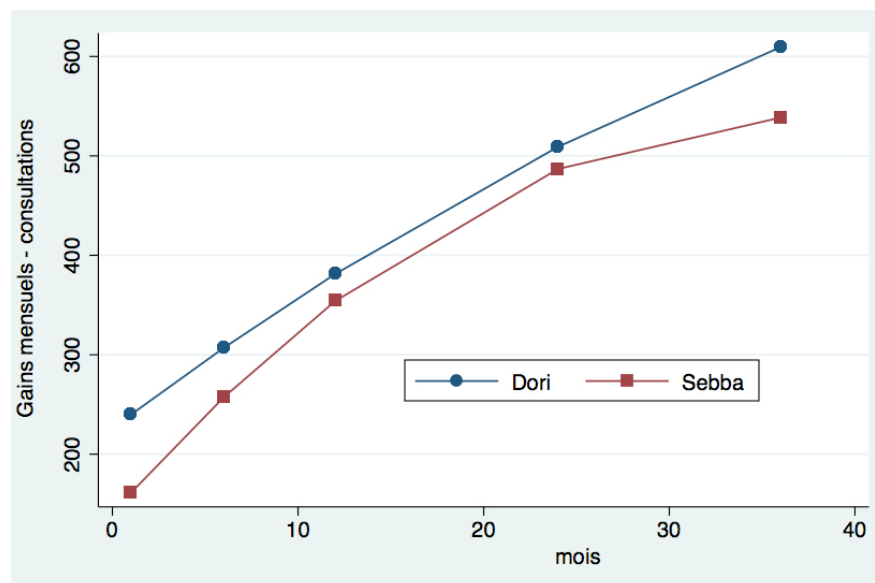
Attributable effects of the intervention per site



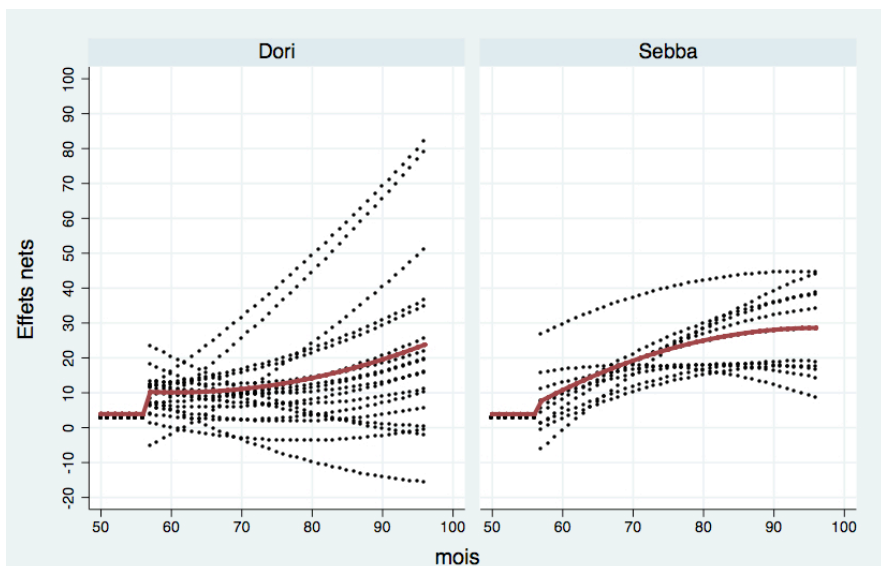
30

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Net gains: consultations per month per centre



Heterogeneity of the response to the intervention. Random effect models



Effects of the intervention by place of residence (IITS – 18 HC- intervention site and controls)

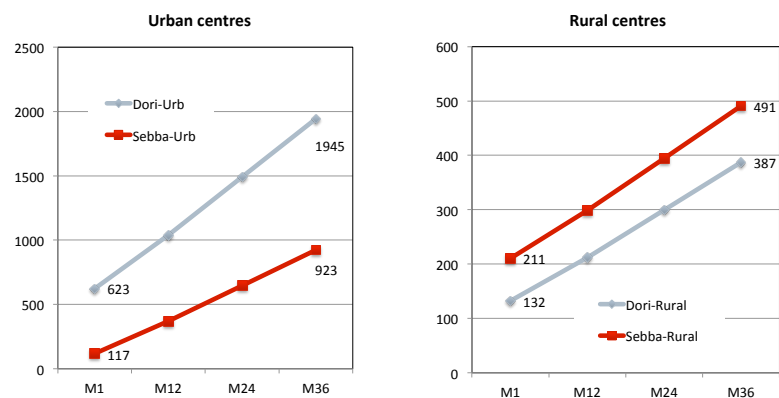
Distance of the health centre from home	Users per day per centre, pre-intervention period	Effects of the intervention	
		Rate ratio Estimate & [95% conf. interval]	Average increase (additional users per day and % increase)
d < 5km	1.78	2.21 [1,74; 2,79]	2.15 121%
5 km ≤ d < 10 km	0.98	2.43 [1,92;3,09]	1.4 143%
d ≥ 10 km	1.68	1.77 [1,39; 2,24]	1.29 77%
All	4.44	2.09 [1,67; 2,63]	4.85 109%

adjusting for Center, center size, district, secular trend, and seasonal variation

33

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Attendance in health centres: estimates gains in monthly consultations over time (1 M, 1Y, 2Y, 3Y)



34

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Did the wealthier benefit more (panel survey)?

Payment for medication before (2008) and after (2009) the implementation of the exemption policy (predicted values*)

Sratum	2008	2009	Difference	Double Diff.
Poor	0,89 [0,80 ; 0,97]	0,12 [0,03 ; 0,21]	-0,77 [-0,89 ; -0,64]	
Non Poor	0,87 [0,78 ; 0,96]	0,08 [0,02 ; 0,15]	-0,79 [-0,91 ; -0,67]	
Difference	0,02 [-0,10 ; 0,13]	0,04 [-0,07 ; 0,14]		

Double Diff. 0,02
[-0,15 ; 0,19]

Adjusted for: age, sex, major symptoms, severity of illness, household residence, income .

35

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Utilization of PHC centres across income groups, by place of residence and severity of illness

Severity	Place of residence	Income group		Ratio (1)/(2) Est. & [95% conf. interval]
		First income quartile	Other income groups	
		Rate Ratio (*) & [95% conf. interval]	Rate Ratio (*) & [95% conf. interval]	
Severe	d<5 km	5.23 [1.30-21.0]	2.23 [1.29-3.86]	2.35 [0.44-12.45]
	d≥5 km	1.28 [0.90-1.82]	1.56 [0.87-2.79]	0.82 [0.40-1.66]
Not severe	d<5 km	0.87 [0.39-1.95]	1.90 [1.23-2.92]	0.46 [0.20-1.04]
	d≥5 km	1.15 [0.54-2.47]	1.65 [1.20-2.27]	0.70 [0.34-1.42]

(*) Rate ratios estimated by multilevel Poisson regression

36

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