# Pro-birth policies, missions and fertility: historical evidence from Congo

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African History Through the Lens of Economics

# 1. Introduction

# Introduction -1

- We investigate **whether and how** missions (Catholic, Catholic with nuns or Protestant) modified fertility behaviour in colonial Congo (and right after independence).

- We check whether we find signs of **persistence** of these effects in the latest two waves of the DHS (2007, 2013).

- More generally, we are interested in how colonial presence, in the form of missions, modified the core of the social organization of the local population : the **family**.

# Introduction -2

***For the future of the race and the prosperity of our colony, we must count on high childbirths.***

P.J. Bourgaux, UMHK, cited by Likaka in "Colonial Response to Population Depletion in Early Congo" 2006

- The Belgian colonial state implemented **pro-birth policies** from the 1920s to independence.
- It actively mobilized **Catholic missions to put them in place**, relying on Catholic **female** missionaries in particular
- Protestant missionaries were from the UK, Sweden or the USA and more **independent** (financially and ideologically).

# 2. Context

# Context - 1

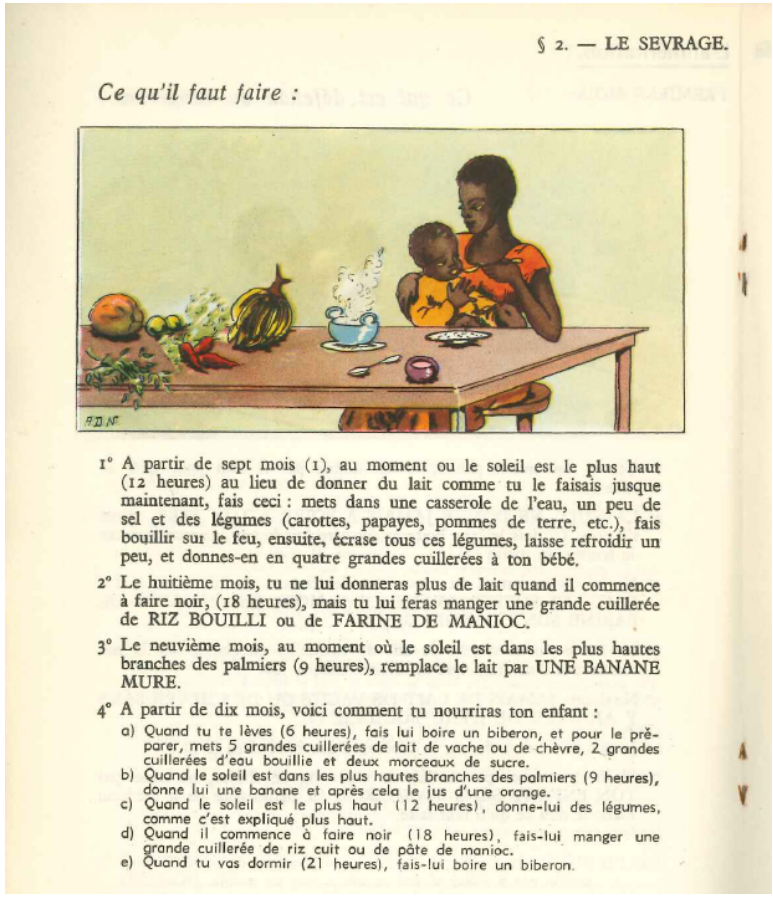
- **Depopulation of the colonies was feared** in several African countries and in particular in the Belgian Congo.
  - Without workers, a colony was worth little.
  - Depopulation : dominant theme of the colonial demographic literature (Hunt, 1988).
  - **Several medical studies** devoted to this question.

- Birth rates were low.
  - Attributed to European occupation and indigenous practices.

# Context - 2

The State response was to rely on the massive flow of Catholic female missionaries to :

- **Promote appropriate delivery and infant care practices**
- **Modify sexual behaviour** to promote natality : fight polygamy, reduce periods of post-partum abstinence, promote the ideal of "Christian marriages"
- **Modify breastfeeding practices** to reduce birth spacing



§ 2. — LE SEVRAGE.

*Ce qu'il faut faire :*

1° A partir de sept mois (1), au moment ou le soleil est le plus haut (12 heures) au lieu de donner du lait comme tu le faisais jusque maintenant, fais ceci : mets dans une casserole de l'eau, un peu de sel et des légumes (carottes, papayes, pommes de terre, etc.), fais bouillir sur le feu, ensuite, écrase tous ces légumes, laisse refroidir un peu, et donnes-en en quatre grandes cuillerées à ton bébé.

2° Le huitième mois, tu ne lui donneras plus de lait quand il commence à faire noir, (18 heures), mais tu lui feras manger une grande cuillerée de RIZ BOUILLI ou de FARINE DE MANIOC.

3° Le neuvième mois, au moment où le soleil est dans les plus hautes branches des palmiers (9 heures), remplace le lait par UNE BANANE MURE.

4° A partir de dix mois, voici comment tu nourriras ton enfant :

a) Quand tu te lèves (6 heures), fais lui boire un biberon, et pour le préparer, mets 5 grandes cuillerées de lait de vache ou de chèvre, 2 grandes cuillerées d'eau bouillie et deux morceaux de sucre.
b) Quand le soleil est dans les plus hautes branches des palmiers (9 heures), donne lui une banane et après cela le jus d'une orange.
c) Quand le soleil est le plus haut (12 heures), donne-lui des légumes, comme c'est expliqué plus haut.
d) Quand il commence à faire noir (18 heures), fais-lui manger une grande cuillerée de riz cuit ou de pâte de manioc.
e) Quand tu vas dormir (21 heures), fais-lui boire un biberon.

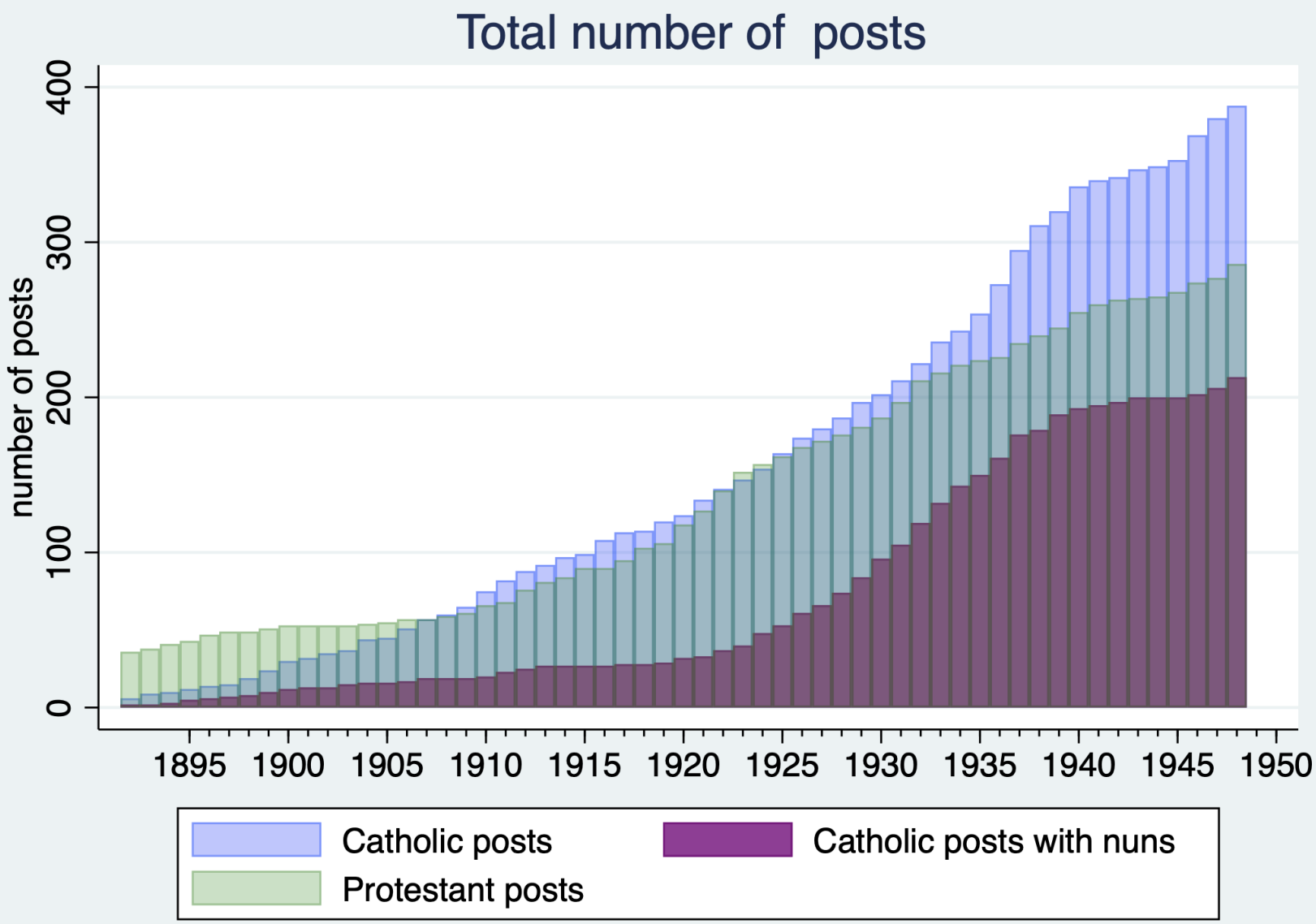
# 3. Data and variable construction

# Data on missions

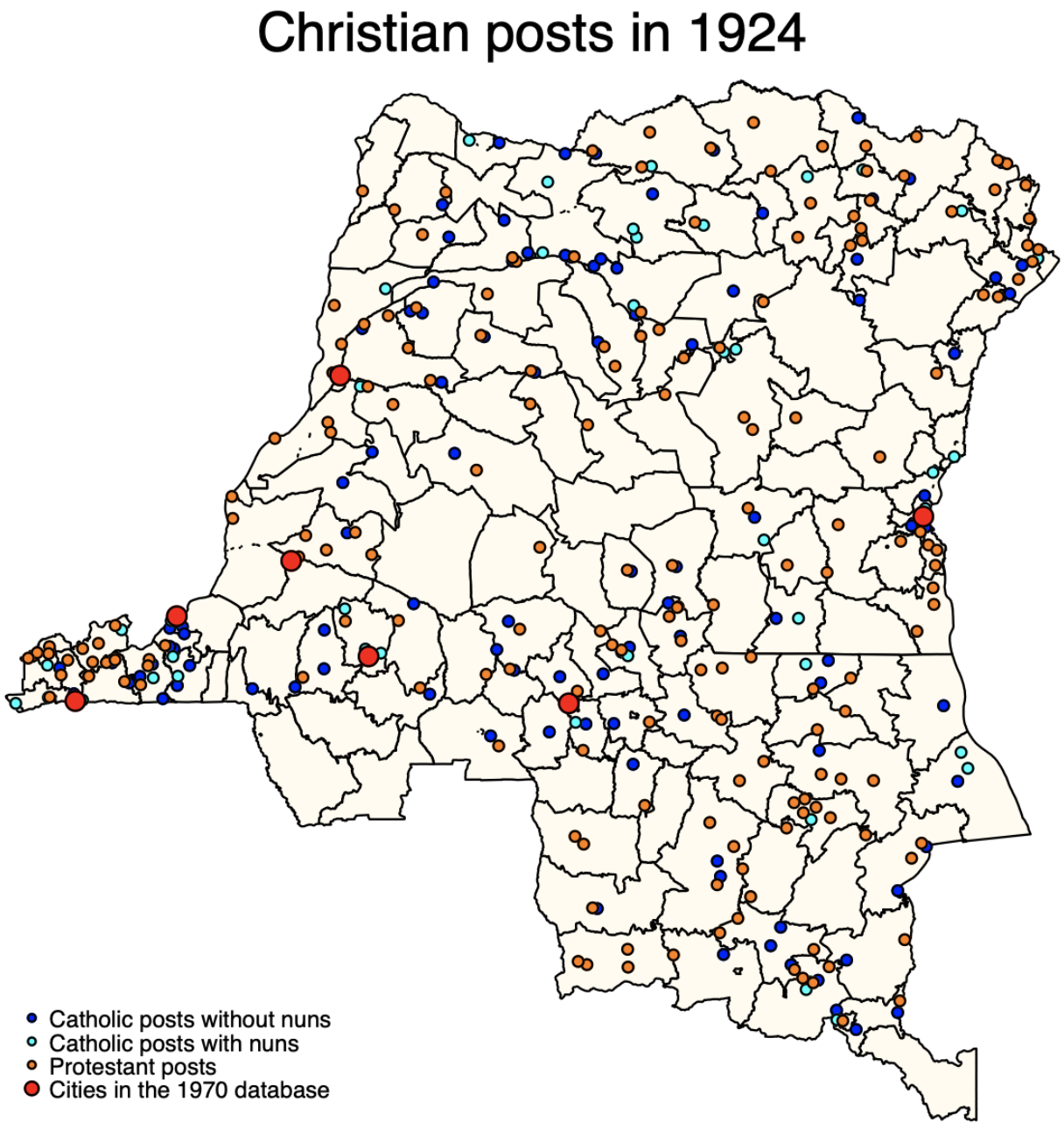
- Sources for date of creation of posts :
  - Two exhaustive yearbooks for Catholics (1921 and 1948).
  - For Protestants : two yearbooks (1961 and 1978) and six official maps (1905-1960).

- Measures of missionary presence at the territory level in any given year :
  - Presence of a post of a given type (Catholic, Catholic with nuns, Protestant) in the territory.
  - Average distance to each type of mission of any point in the territory. Construction : take 1000 random point within the territory, compute distances, take averages (as in Calvi et al., 2018).
  - We use linear distance and log(distance)

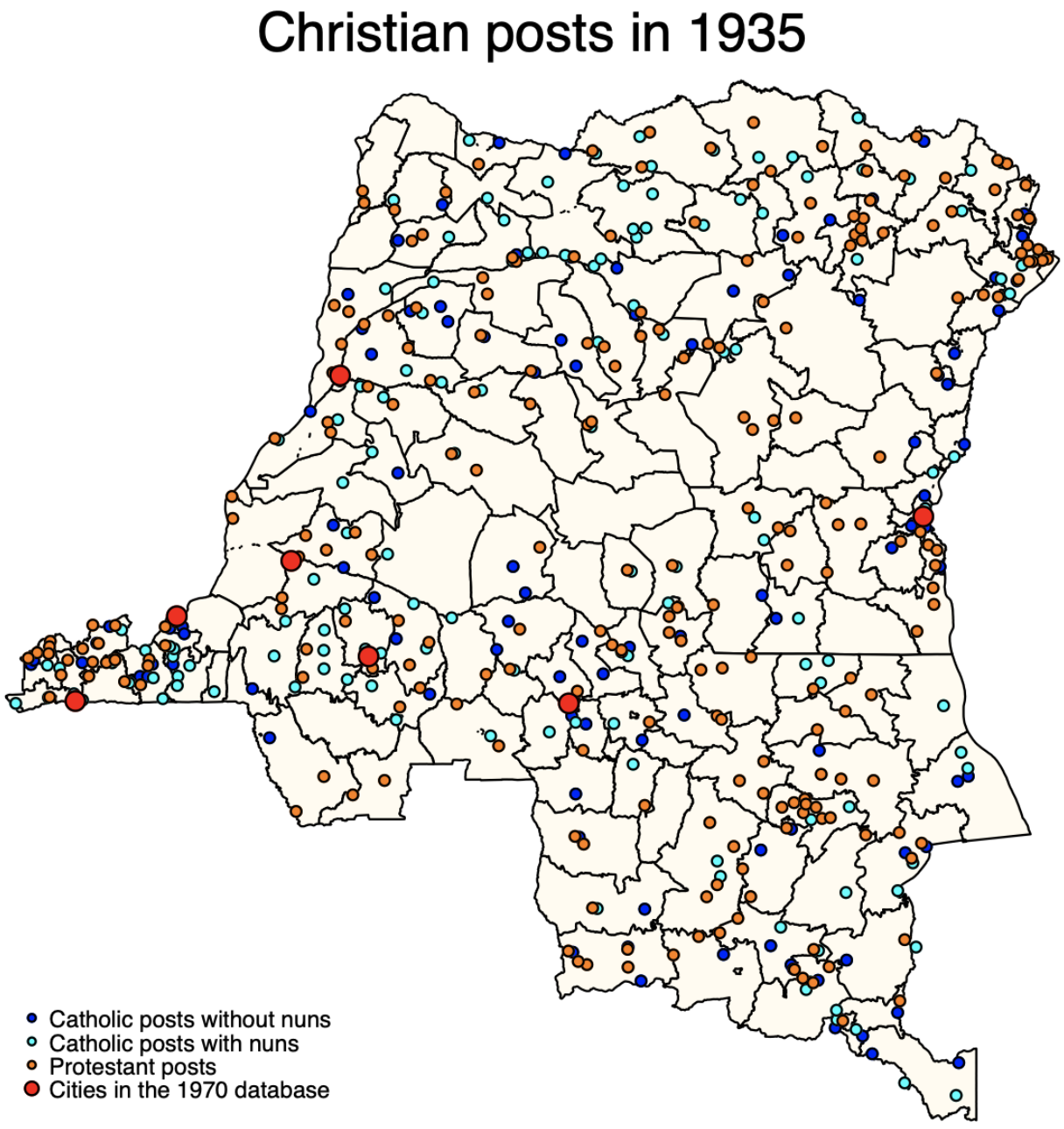
# Trend in missionary presence



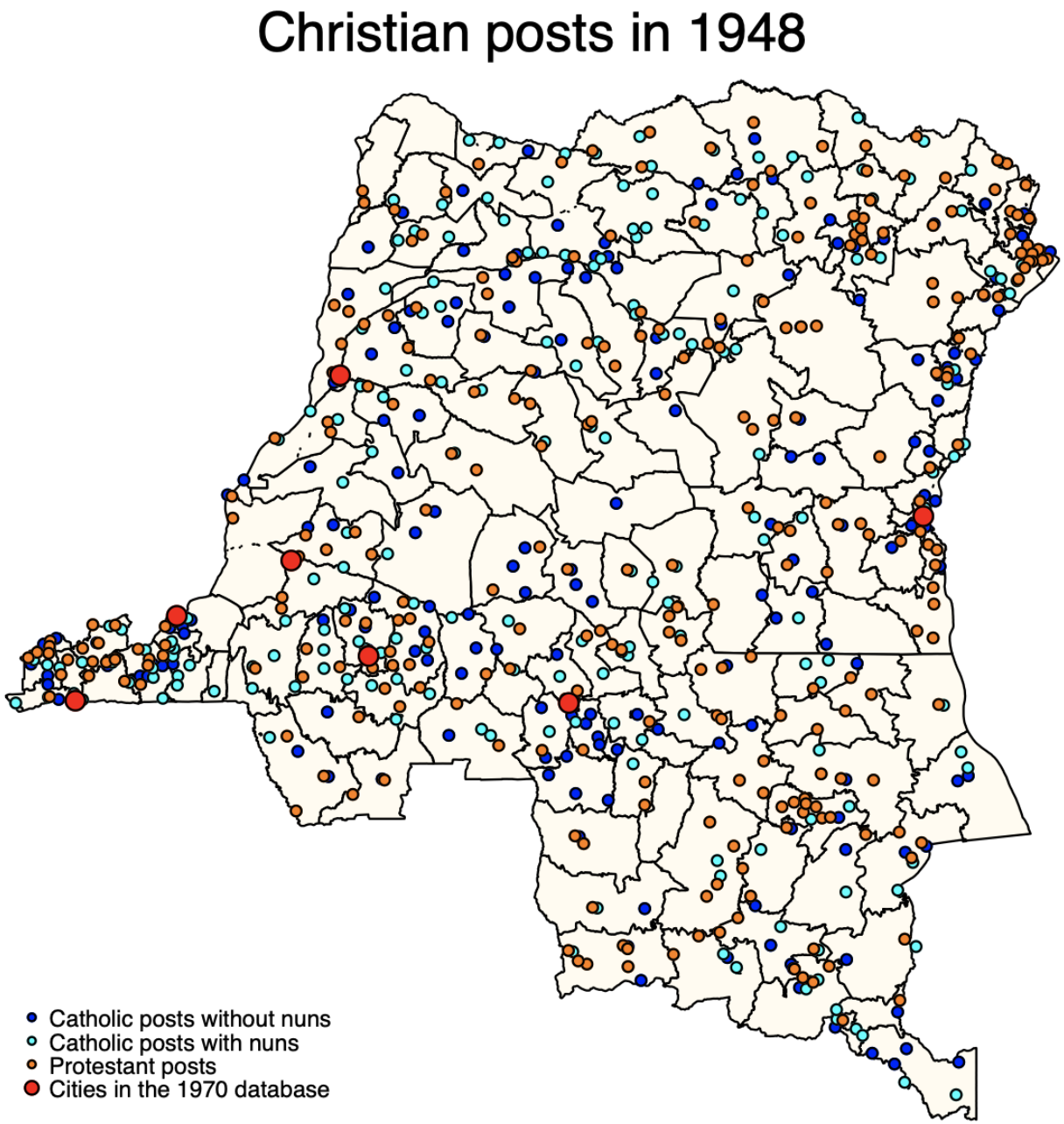
# Trend in missionary presence



# Trend in missionary presence



# Trend in missionary presence



# Demographic data : 1970s data

Demographic survey of the urban population in the 1970s :

- Cities that were part of the 1970s surveys : Kinshasa, Matadi, Bandundu, Kikwit, Mbandaka, Kananga, Bukavu.
- **Individual records for 12% of inhabitants** : territory of birth, birth date, occupation, marital status, **calendar of birth of all children women ever had**.

# Demographic data : 1950s data

- We digitized the results of the demographic survey of the mid-1950s (10% of population surveyed).
- It provides information on fertility at the **territory *cohort level** (territory : smallest administrative unit).

TABLEAU 13bis NAISSANCES AU COURS DE L'EXISTENCE DE LA MERE PAR TERRITOIRE
TABEL GEBOORTEN TIJDENS HET BESTAAN DER MOEDER PER GEWEST

| Age / Leeftijd | Nombre total des femmes / Totaal der vrouwen | Nombre de femmes fécondes / Aantal der vruchtbare vrouwen | Nombre total des naissances / Totaal der geboorten | Nombre de naissances en vie / Aantal der levende geboorten | Nombre moyen d'enfants par femme / Gemmideld aantal kinderen per vrouw (1) | Nombre moyen d'enfants par femme féconde / Gemmideld aantal kinderen per vruchtbare vrouw (2) | % d'enfants encore en vie / % van nog in leven zijnde kinderen (3) |
|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| **Boma** | | | | | | | |
| 15-19 | 2.461 | 851 | 1.006 | 864 | 0,40 | 1,18 | 85,88 |
| 20-24 | 3.491 | 2.862 | 5.672 | 4.493 | 1,62 | 1,98 | 79,21 |
| 25-29 | 3.023 | 2.710 | 8.658 | 6.236 | 2,86 | 3,19 | 72,02 |
| 30-34 | 2.187 | 1.862 | 8.156 | 5.670 | 3,72 | 4,38 | 69,52 |
| 35-44 | 2.133 | 1.747 | 8.790 | 6.018 | 4,12 | 5,03 | 68,46 |
| 45-54 | 1.327 | 1.062 | 5.725 | 3.108 | 4,31 | 5,39 | 54,29 |
| +de55 | 1.072 | 953 | 5.486 | 2.342 | 5,11 | 5,75 | 42,69 |
| Total / Totaal | 15.694 | 12.047 | 43.493 | 28.731 | 2,77 | 3,61 | 66,06 |
| **Matadi** | | | | | | | |
| 15-19 | 3.070 | 1.023 | 1.214 | 963 | 0,39 | 1,18 | 79,32 |
| 20-24 | 4.485 | 3.721 | 6.786 | 5.539 | 1,51 | 1,82 | 81,62 |
| 25-29 | 4.059 | 3.623 | 11.573 | 8.907 | 2,85 | 3,19 | 76,96 |
| 30-34 | 3.196 | 2.898 | 13?641 | 10.091 | 4,26 | 4,70 | 73,98 |
| 35-44 | 2.615 | 2.369 | 14.176 | 9.805 | 5,42 | 5,98 | 69,17 |
| 45-54 | 1.276 | 1.167 | 7.681 | 4.423 | 6,01 | 6,58 | 57,58 |
| +de55 | 662 | 579 | 3.628 | 1.627 | 5,48 | 6,26 | 44,85 |
| Total / Totaal | 19.363 | 15.380 | 58.699 | 41.355 | 3,03 | 3,81 | 70,45 |
| **Lukula** | | | | | | | |

# 4. Empirical Strategy

# Empirical strategy

Historical analysis :

We exploit the **arrival of new missions of different types** (Catholic, Catholic with nuns, Protestants) at different dates in the 148 territories of the country and compare cohorts (less) exposed or not :

- With the sample of urban individual records we **compare different cohorts (at the same age) within the same territory**.
- With the sample of aggregated cohort-territory records we **compare different cohorts within the same district**.

# Empirical strategy

Empirical strategy, DHS data :

- We pool the 2007 and 2013 data and estimate whether women living closer to former missions have different fertility related behaviours.
- We include all classic controls to mitigate biases related to the non-random location of missionary posts.

# 5. Results

# Results : fertility at given age by exposure

- When women grew up closer to **Catholic missions with nuns**, they have **more children** (at 25, 35, 40 and 45) : reducing by 100 km the average distance in their territory of birth increases the number of children by 0.2 at age 35-45.
- When women grew up closer to **Protestant missions**, they have **fewer children** : reducing by 100 km the average distance to a Catholic mission with nuns in their territory of birth decreases the number of children by 0.15 at age 35-45.
- The sharp contrast between Catholic and Protestant missions is **confirmed in the nationally representative data of the 1950s** : Women above 15 have on average 0.3 fewer children (at the time of the survey), when they grew up 100km closer to a protestant mission and 0.3 more when they grew up 100km closer to a catholic mission.

Result Table

# Results : age at first birth, birth intervals and infant mortality

- Women who grew up closer to Catholic missions with nuns have their first child several months earlier and the opposite holds for Protestant.

- When women grew up closer to **Protestant missions**, they have modestly **longer birth intervals** : decreasing by 100 km the average distance to a Protestant mission in their territory of birth increases birth intervals by 2 months (btw first 2 children).

- Catholic missions do not appear to influence birth spacing.

- **No consistent results on infant mortality**. Growing up closer to Protestants or Catholic missions with nuns may decrease infant mortality (effect only present with exposure at age 0)

# Results : Heterogeneity by post activities

Results By Activity

- The effect of Catholic nuns seems driven by the presence of **housekeeping schools** at the mission. Maternity wards and child health post are not correlated with higher fertility of women exposed in their infancy.

- Interestingly, workrooms (who offered some economic opportunities to women) have the opposite effect on fertility : their presence tends to decrease fertility.

# Threats to identification

**Endogenous timing of post installation ?**

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# Threats to identification

**Endogenous timing of post installation ?**

- **No historical or statistical evidence** that Protestants and Catholics had different strategies of deployments.

Is **selective migration** driving the correlations between the fertility of urban women in the 1970s and missionary presence in their place of birth ?

- The comparison between the results obtained on the 1950s and on the 1970s data is reassuring.

# 6. Long term impacts

# Long term impacts

Do historical Catholic and Protestant missions **continue to influence fertility** in present times ?

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Do historical Catholic and Protestant missions **continue to influence fertility** in present times ?

- We compute the distance of the place of residence to the closest Catholic and Protestant missions in 1948. We add the same historical controls as before.
- We estimate the influence of distance to historical missions on the following outcomes : religion today, fertility (at various ages), birth spacing, abstinence and breastfeeding.

# Long-term impacts

- Women living closer to a Catholic (Protestant) mission are (much) more likely to be Catholic (Protestant).
- Women **closer to Protestant** historical missions have **fewer children** (0.18 at 25 for a 100km decrease in distance) and **longer birth intervals**.
- No clear effect of Catholic missions in general. Results Fertility
- Women **closer to Catholic missions** are less **likely to breastfeed** their child below 1.
- Women with children below 1 appear (slightly) less likely to abstain when they are living closer to historical Catholic missions.

Results Breastfeeding

# 7. Discussion

# Discussion

Three main conclusions :

- In line with the objective of pro-birth policies, Catholic nuns appear to have succeeded in **stimulating fertility** among the population living in their neighbourhood.
- Protestant missions have an **opposite influence** on fertility : women who grew up closer to Protestant missions have lower fertility levels.
- Some of these influences have persisted across time.

# Discussion

What are the mechanisms ? Why this difference across religions ?

- Missions' activities targeted towards women seem of foremost importance.
- Analysis of these activity suggests two potential channels for the effect of Catholic nuns : **health** and **promotion of natality**.
- Could improvement in general health *alone* explain the positive effect of Catholic female missionaries (and the contrast with Protestant) ?
  - Historical evidence suggests that health intervention of Catholic **not of better quality**
  - **Infant mortality not lower** for mothers who grew up closer to Catholic posts than to Protestant posts.

# Discussion

- Could nuns have modified the demand for children through the **promotion of conservative gender roles** ?
  - *Catholic missionaries created schools, which they transformed into vehicles of cultural change to influence sexual behaviors of younger generations. [...] From missions stations, the "pro-natal" discourse extended into local communities. In reality, this treaty had [...] far-reaching consequences in transforming sexual behavior and the ideologies of bilogical reproduction because of missionaries' control over schooling [...]* Likaka (2006)
  - Consistent with the result that housewives schools have the strongest positive impact on fertility.
- Both health and education may have **modified infant care**, in particular breastfeeding practices, thereby, indirectly influencing fertility.

# Discussion

Why do Protestants have a very different impact on fertility behaviours ?

- Girls' education may have been **less focused on teaching housekeeping skills** (Yates, 1982)
- More labour opportunities for women at Protestant missions
- Different view of "Christian marriage"
- Protestant female missionaries typically came from **more progressive environments**.
- A large literature shows the positive influence of Protestantism on girls' education in very different contexts (Becker and Woessmann, 2008 ; Becker et al. 2021 ; Nunn, 2014).

# Conclusion

- **Missions may have been efficient** at changing behaviour on an aspect of life that is typically regarded as very **deeply culturally embedded** (Fernandez and Fogli, 2009).

- Other examples of how **religion influences attitudes, preferences and behaviour** : review of Iyer, 2016 ; Becker et al., 2010 on the influence of Protestantism on gender gaps ; Bassi and Rasul, 2017, on papal influence on fertility ; Goody, 1983 and Schultz, 2018 on influence of Catholic church on the ban of kin marriages in medieval Europe

# Results : fertility

| | Age 25 | Age 35 | Age 40 | Age 45 |
|---|---|---|---|---|
| **Panel : Any post in district (0/1)** | | | | |
| | *(1)* | *(2)* | *(3)* | *(4)* |
| ExpCatholics - All (C) | −0.074 | −0.012 | 0.076 | 0.086 |
| | (0.085) | (0.158) | (0.162) | (0.174) |
| ExpCatholics - Nuns (CN) | 0.179*** | 0.214** | 0.145 | 0.350** |
| | (0.065) | (0.108) | (0.133) | (0.155) |
| ExpProtestants (P) | −0.129 | −0.260** | −0.290** | −0.251 |
| | (0.086) | (0.131) | (0.138) | (0.159) |
| Controls | *Yes* | *Yes* | *Yes* | *Yes* |
| Territoire FE | *Yes* | *Yes* | *Yes* | *Yes* |
| N | 27660 | 15753 | 9942 | 6355 |
| Adjusted R2 | 0.09 | 0.13 | 0.13 | 0.12 |
| Mean of dep. var. | 2.82 | 5.40 | 5.96 | 5.98 |
| pvalue(C = CN) | 0.023 | 0.290 | 0.772 | 0.279 |
| pvalue(C = P) | 0.697 | 0.309 | 0.137 | 0.207 |
| pvalue(CN = P) | 0.002 | 0.002 | 0.010 | 0.007 |

Standard errors, in (), are clustered at the birth district level.
* p ≤ 0.1, ** p ≤ 0.05, *** p ≤ 0.01.

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# Results : fertility

| | Age 25 | Age 35 | Age 40 | Age 45 |
|---|---|---|---|---|
| **Panel A : Proximity to post - Linear measure** | | | | |
| | *(1)* | *(2)* | *(3)* | *(4)* |
| ExpCatholics - All (C) | 0.077 | −0.119 | −0.003 | 0.014 |
| | (0.117) | (0.177) | (0.208) | (0.209) |
| ExpCatholics - Nuns (CN) | 0.031 | 0.190* | 0.194** | 0.231*** |
| | (0.079) | (0.112) | (0.086) | (0.085) |
| ExpProtestants (P) | −0.126 | −0.152 | −0.165 | −0.217* |
| | (0.079) | (0.111) | (0.106) | (0.128) |
| N | 27660 | 15753 | 9942 | 6355 |
| Adjusted R2 | 0.09 | 0.13 | 0.13 | 0.12 |
| Mean of dep. var. | 2.82 | 5.40 | 5.96 | 5.98 |
| pvalue(C = CN) | 0.773 | 0.199 | 0.433 | 0.406 |
| pvalue(C = P) | 0.227 | 0.892 | 0.544 | 0.421 |
| pvalue(CN = P) | 0.166 | 0.042 | 0.010 | 0.003 |
| **Panel B : Proximity to post - Log measure** | | | | |
| ExpCatholics - All (C) | 0.176* | −0.059 | −0.039 | 0.072 |
| | (0.094) | (0.129) | (0.159) | (0.169) |
| ExpCatholics - Nuns (CN) | 0.159* | 0.234* | 0.217** | 0.373*** |
| | (0.087) | (0.121) | (0.104) | (0.106) |
| ExpProtestants (P) | −0.233*** | −0.224** | −0.138 | −0.249* |
| | (0.066) | (0.105) | (0.117) | (0.140) |
| Controls | *Yes* | *Yes* | *Yes* | *Yes* |

# Results : cohort fertility in 1950s

| | (1) All (linear distance) | (2) All (log distance) | (3) >35 (linear distance) | (4) >35 (log distance) |
|---|---|---|---|---|
| ExpCatholics_All | 0.293** | 0.253* | 0.193 | 0.207 |
| | (0.114) | (0.140) | (0.118) | (0.177) |
| ExpCatholics_Nuns | 0.050 | -0.039 | 0.071 | 0.205 |
| | (0.092) | (0.125) | (0.095) | (0.162) |
| ExpProtestants | -0.282** | -0.193* | -0.219 | -0.306* |
| | (0.108) | (0.110) | (0.155) | (0.156) |
| _cons | -15.462** | -14.149* | -14.765 | -14.046 |
| | (7.294) | (7.389) | (11.160) | (11.082) |
| *N* | 742 | 742 | 318 | 318 |

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

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# Results : Heterogeneity by post activities - Fertility

| | Age 25 | Age 35 | Age 40 | Age 45 |
|---|---|---|---|---|
| | *(1)* | *(2)* | *(3)* | *(4)* |
| **Panel A : Proximity to post - Linear measure** | | | | |
| ExpCatholics - All | 0.068 | −0.080 | 0.021 | 0.008 |
| | (0.109) | (0.173) | (0.207) | (0.209) |
| ExpCatholics - Nuns | −0.037 | 0.063 | 0.034 | 0.092 |
| | (0.077) | (0.110) | (0.091) | (0.100) |
| ExpCatholics - Nuns - Workrooms | 0.008 | −0.071** | −0.083** | −0.012 |
| | (0.022) | (0.028) | (0.039) | (0.039) |
| ExpCatholics - Nuns - Housekeeping school and workshops | 0.063*** | 0.144*** | 0.168*** | 0.141*** |
| | (0.022) | (0.035) | (0.042) | (0.046) |
| ExpCatholics - Nuns - Women health activities | −0.008 | 0.044** | 0.020 | −0.013 |
| | (0.017) | (0.021) | (0.025) | (0.028) |
| ExpProtestants | −0.088 | −0.232** | −0.189 | −0.163 |
| | (0.074) | (0.112) | (0.130) | (0.153) |
| Adjusted R2 | 0.09 | 0.13 | 0.13 | 0.12 |
| **Panel B : Proximity to post - Log measure** | | | | |
| ExpCatholics - All | 0.160* | −0.035 | −0.035 | 0.050 |
| | (0.096) | (0.130) | (0.157) | (0.176) |
| ExpCatholics - Nuns | 0.047 | 0.101 | 0.047 | 0.203 |
| | (0.094) | (0.135) | (0.121) | (0.137) |
| ExpCatholics - Nuns - Workrooms | 0.035 | −0.077* | −0.114 | 0.096 |
| | (0.035) | (0.045) | (0.079) | (0.071) |
| ExpCatholics - Nuns - Housekeeping school and workshops | 0.107** | 0.129** | 0.218*** | 0.233** |
| | (0.046) | (0.060) | (0.081) | (0.092) |
| ExpCatholics - Nuns - Women health activities | 0.059 | 0.138** | 0.022 | −0.078 |
| | (0.049) | (0.059) | (0.053) | (0.064) |
| ExpProtestants | −0.244*** | −0.298** | −0.139 | −0.195 |
| | (0.078) | (0.124) | (0.129) | (0.160) |
| Adjusted R2 | 0.09 | 0.13 | 0.13 | 0.12 |
| Controls | *Yes* | *Yes* | *Yes* | *Yes* |
| Territory FE | *Yes* | *Yes* | *Yes* | *Yes* |
| Mean of dep. variable | 2.82 | 5.40 | 5.96 | 5.98 |
| N | 27660 | 15753 | 9942 | 6355 |

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# DHS Results on fertility

| | *(1)* Age 17 | *(2)* Age 20 | *(3)* Age 25 | *(4)* Age 30 | *(5)* Age 35 | *(6)* Age 40 |
|---|---|---|---|---|---|---|
| **Panel A : Linear distance** | | | | | | |
| ExpCatholics-All (C) | −0.024 | −0.074 | −0.124 | −0.039 | −0.172 | 0.066 |
| | (0.039) | (0.067) | (0.109) | (0.154) | (0.225) | (0.333) |
| ExpProtestants (P) | −0.058* | −0.099* | −0.177* | −0.166 | −0.196 | −0.069 |
| | (0.032) | (0.055) | (0.092) | (0.128) | (0.183) | (0.255) |
| Adjusted R2 | 0.03 | 0.05 | 0.08 | 0.08 | 0.09 | 0.09 |
| pvalue(C = P) | 0.558 | 0.787 | 0.730 | 0.534 | 0.938 | 0.762 |
| **Panel B : Log distance** | | | | | | |
| ExpCatholics-All (C) | −0.010 | −0.022 | −0.035 | −0.008 | −0.024 | 0.018 |
| | (0.008) | (0.014) | (0.023) | (0.032) | (0.043) | (0.065) |
| ExpProtestants (P) | −0.010 | −0.023 | −0.042* | −0.069* | −0.082 | −0.036 |
| | (0.008) | (0.014) | (0.025) | (0.037) | (0.053) | (0.073) |
| Controls | *Yes* | *Yes* | *Yes* | *Yes* | *Yes* | *Yes* |
| Region FE | *Yes* | *Yes* | *Yes* | *Yes* | *Yes* | *Yes* |
| N | 21301 | 19161 | 14170 | 9800 | 6455 | 3735 |
| Adjusted R2 | 0.03 | 0.05 | 0.08 | 0.08 | 0.09 | 0.09 |
| Mean of dep. var. | 0.37 | 1.02 | 2.45 | 3.87 | 5.17 | 6.15 |
| pvalue(C = P) | 0.954 | 0.955 | 0.849 | 0.234 | 0.429 | 0.595 |

Standard errors, in (), are clustered at the DHS cluster level.
* $p \leq 0.1$, ** $p \leq 0.05$, *** $p \leq 0.01$.

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# Results on abstaining, breastfeeding

## Currently abstaining, breastfeeding of last child (2007 data only)

| | *(1)* Breastfed <12 | *(2)* Abstain <12 | *(3)* Breastfed 12-24 | *(4)* Abstain 12-24 |
|---|---|---|---|---|
| **Panel A : Linear distance** | | | | |
| ExpCatholics-All (C) | −0.054** | −0.035 | 0.030 | −0.004 |
| | (0.022) | (0.043) | (0.040) | (0.043) |
| ExpProtestants (P) | −0.026 | −0.003 | −0.063* | −0.010 |
| | (0.018) | (0.037) | (0.035) | (0.034) |
| Adjusted R2 | 0.01 | 0.23 | 0.16 | 0.04 |
| pvalue(C = P) | 0.356 | 0.612 | 0.118 | 0.918 |
| **Panel B : Log distance** | | | | |
| ExpCatholics-All (C) | −0.011** | −0.016* | −0.005 | −0.009 |
| | (0.005) | (0.008) | (0.008) | (0.008) |
| ExpProtestants (P) | −0.008 | 0.012 | −0.016 | 0.000 |
| | (0.005) | (0.010) | (0.010) | (0.009) |
| Controls | *Yes* | *Yes* | *Yes* | *Yes* |
| Region FE | *Yes* | *Yes* | *Yes* | *Yes* |
| N | 5416 | 5416 | 4601 | 4601 |
| Adjusted R2 | 0.01 | 0.23 | 0.16 | 0.04 |
| Mean of dep. var. | 0.91 | 0.43 | 0.64 | 0.19 |
| pvalue(C = P) | 0.783 | 0.044 | 0.443 | 0.512 |

Standard errors, in (), are clustered at the DHS cluster level.
* $p \leq 0.1$, ** $p \leq 0.05$, *** $p \leq 0.01$.

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