

# IMPACT EVALUATION OF PERFORMANCE BASE FINANCING

## FOR GENERAL HEALTH AND HIV/AIDS SERVICES In RWANDA

A collaboration between the Rwanda Ministry of Health, CNLS, and SPH, the INSP in Mexico, UC Berkeley and the World Bank

# RWANDA general & health sector

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- Total population : ~ 11 M (2012)
- 30 Administrative districts
- GDP per capita of \$550
- 42 District Hosp. and 430 Health centers
- MMR:       750 per 100,000 (DHS 2005)  
              487 per 100,000 (DHS 2010)
- IMR:        86 per 1,000 (DHS 2005)  
              50 per 1,000 (DHS 2010)
- HIV:        3.1% (DHS 2005)
- 3.0% (DHS 2010)

# Relevance and Severity of the Health Issue Addressed

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- Diagnostic
  - ▣ Shortage of human resources for health services
  - ▣ Low levels of productivity and motivation
  - ▣ High levels of absenteeism
  - ▣ Low user satisfaction & poor quality of service lead to low use.
  - ▣ Increase morbidity and mortality
- Goal
  - ▣ Increase number of trained medical personnel
  - ▣ Increase motivation
  - ▣ Improve quality of services
  - ▣ Increase personnel income of health staff
- Policy Response
  - ▣ Performance Based Contracting & Financing

# RWANDA Performance Based Financing (PBF)

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- Raises the quantity and quality of health services provided
- Increases health worker motivation through a system of incentives payments based on performance
- Operates through contracts between the government and other partners (providing the financing) and health facilities (providing services)

# History of PBF in Rwanda

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## **Three pilot schemes:**

- Cyangugu (since 2001)
- Butare (since 2002)
- BTC (since 2005)
- National model implemented in 2006

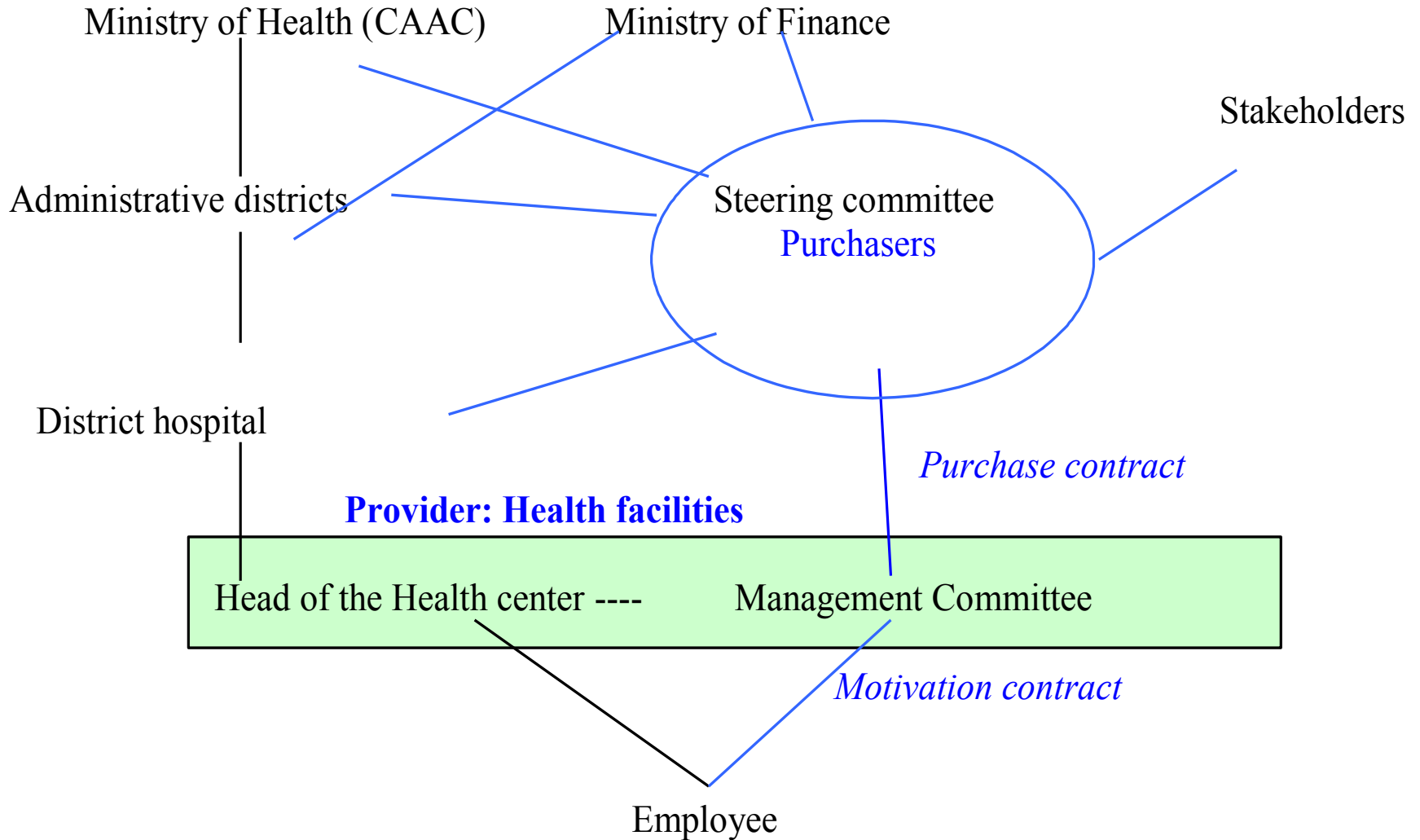
# National PBC model for Health Centers

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- 14 Primary Health Care indicators, e.g.:
  - ▣ New Curative Consultation = \$0.27
  - ▣ Delivery at the HC = \$3.63
  - ▣ Completely vaccinated child = \$ 1.82
- 10 HIV/AIDS indicators, e.g.:
  - ▣ One Pregnant woman tested (PMTCT) = \$1.10
  - ▣ HIV+ women treated with NVP = \$1.10
  - ▣ One client tested for HIV = USD 0.92
  - ▣ One couples/partners tested jointly = USD 4.59
- Separation of Functions between stakeholders

# Implementing organizations

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# Hypotheses

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For both general health services and HIV/AIDS, we will test whether PBC:

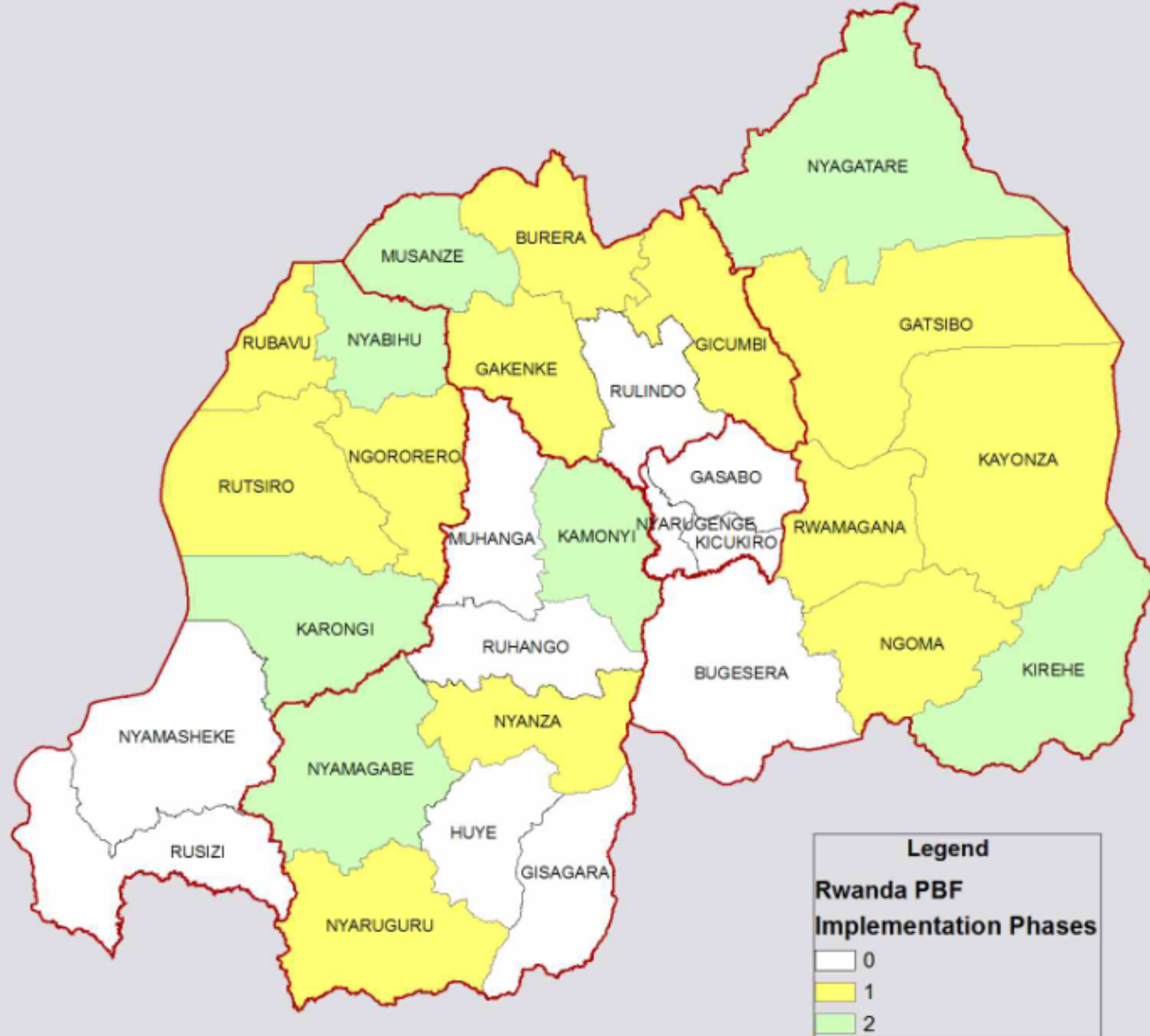
- *Increases the quantity of contracted health services delivered*
- *Improves the quality of contracted health services provided*
- *Does not decrease the quantity or quality of non-contracted services provided,*
- *Decreases average household out-of-pocket expenditures per service delivered*
- *Improves the health status of the population*



# Evaluation Design

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- Make use of expansion of PBC schemes over time
- The rollout takes place at the District level
- Treatment and control facilities were allocated as follow:
  - ▣ Identify districts without PBC in health centers in 2005
  - ▣ Group the districts based on characteristics:
    - rainfall
    - population density
    - livelihoods
  - ▣ Flip a coin to assign districts to treatment and control groups.



# Roll-out plan

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- **Phase 0 districts (white)** are those districts in which PBF was piloted
  - NOT part of the impact evaluation
  
- **Phase 1 districts (yellow)** are districts in which PBF is being implemented in 2006, following the 'roll-out plan'
  
- **Phase 2 districts (green)** are districts in which PBF is phased in later; these are the so-called 'Phase 2' or 'control districts' following the roll-out plan. PBF is being introduced in these districts in 2008.

# More money vs. More incentives

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- Incentive based payments increase the total amount of money available for health center, which can also affect services
- Phase II area receive equivalent amounts of transfers
  - ▣ average of what Phase I receives
  - ▣ Not linked to production of services
  - ▣ Money to be allocated by the health center
  - ▣ Preliminary finding: most of it goes to salaries

# The baseline has 4 surveys

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- December 2005-March 2006:
  - ▣ General Health facility survey (166 centers)
  - ▣ General Health household survey (2,016 HH)
- August – November 2006:
  - ▣ HIV/AIDS facility survey (64 centers)
  - ▣ HIV/AIDS household survey (1994 HH)

# Household Level: Research Hypotheses

- The core of the evaluation is designed to test the following hypothesis, namely performance based contracting:
  - ▣ Improves the health status of the HIV+ patients.
  
- Three additional research questions specifically designed to gather information on the impact of ART on patients, as well as their household members:
  - ▣ What are the *socio-economic benefits* of treatment for patients and their families?
  - ▣ What are the *determinants of adherence* to treatment?
  - ▣ What is the *impact of the availability of treatment on prevention* and on behavior of patients and family members (stigmatization, discrimination, risky sex, and willingness to be tested)?

# Household Level: Data Collection

- Labor market and household socioeconomic indicators
- Anthropometrics of all patients
- CD4 counts of all patients
- Patient biomarker data collection (Anemia, malaria)
- Self-reported and perceived adherence to treatment
- Attitudes and perception regarding anti-retroviral treatment
- Activities of daily living of all patients
- Mental health questions of all patients
- Sexual history, knowledge regarding risk for HIV/AIDS and STD's: females 15-49 years old and males 15-59 years old

# Household Level: Sample Size

- Total sample consists of 1,961 households and 7,494 individuals
- Original sample of 1,487 patients from health facilities and associations

| Patient Treatment: Distribution |        |         |
|---------------------------------|--------|---------|
|                                 | Number | %       |
| No Treatment                    | 196    | 13.18%  |
| Cotrimoxazole                   | 439    | 29.52%  |
| ARV                             | 852    | 57.30%  |
| TOTAL                           | 1487   | 100.00% |



# Follow-up surveys

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- February-August 2008
  
- 3 surveys:
  - ▣ Combined health facilities survey for General Health - HIV/Aids
  - ▣ Household survey for General Health (panel data)
  - ▣ Household survey for HIV/AIDS (panel data)

# Impact Evaluation Results

- Results on general health have been published (Basinga, Gertler et. al, 2010):
  - P4P had a large and significant positive impact on institutional deliveries and preventive care visits by young children, and improved quality of prenatal care.
  - No effect on the number of prenatal care visits or on immunization rates.

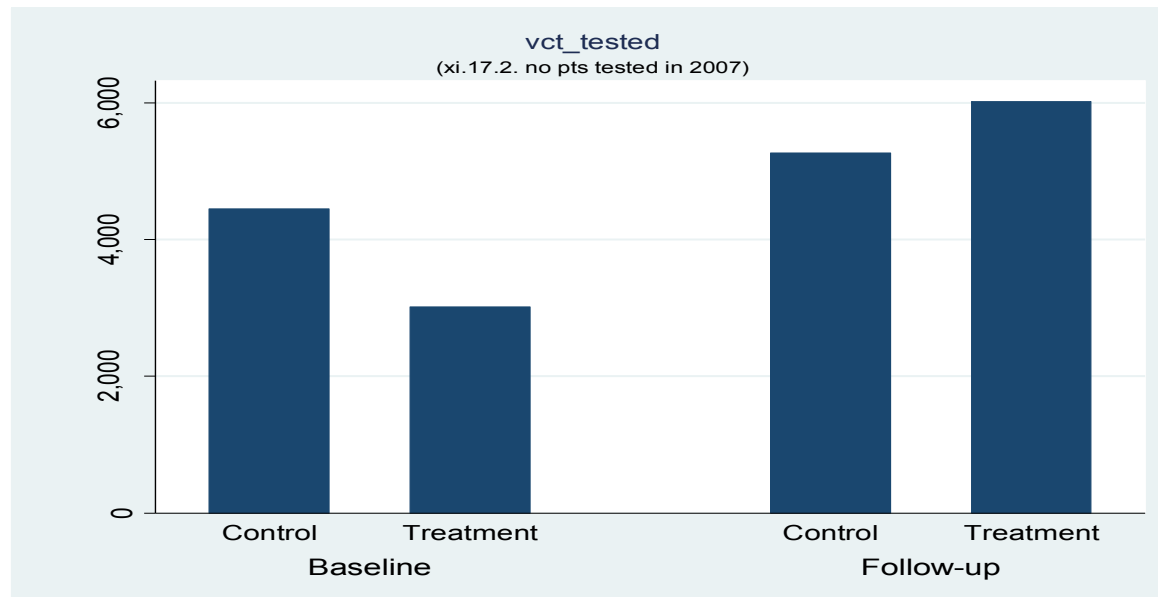
# Impact Evaluation Results

- On HIV/AIDS: Preliminary results on voluntary counseling and testing (VCT)
- Additional results on HIV, especially on anti-retroviral treatment will come later after completing the collection of AIDS patients' biomedical records in the health facilities (ongoing).

# PBF and HIV voluntary counseling and testing (VCT)

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- Information obtained from health facility surveys records
- Number of people tested in the previous year (2005 and 2007)



# Regression analysis (health facility level)

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| vct_tested<br>VARIABLES   | Model 1      |           |       | Model 2      |           |       | Model 3      |           |       |
|---|--------------|-----------|-------|--------------|-----------|-------|--------------|-----------|-------|
|   | coeff        | se        | pval  | coeff        | se        | pval  | coeff        | se        | pval  |
| phase_wave  | 1,943.825*** | (313.667) | 0.000 | 2,086.758*** | (331.768) | 0.000 | 1,826.840*** | (243.793) | 0.000 |
| wave  | 1,010.333*** | (227.829) | 0.000 | 1,107.509*** | (252.420) | 0.001 | 1,308.651*** | (200.477) | 0.000 |
| Rural (0=urban)   |              |           |       | -485.800     | (304.485) | 0.131 | -651.442*    | (327.226) | 0.066 |
| District hospital (0=HC)  |              |           |       | -382.838     | (258.564) | 0.159 | -495.319*    | (262.291) | 0.080 |
| Public (0=assisted by govt)                                     |              |           |       | 265.271      | (300.204) | 0.391 | 80.241       | (242.587) | 0.746 |
| Catchment population  |              |           |       | -0.062***    | (0.010)   | 0.000 | -0.073***    | (0.009)   | 0.000 |
| Total number of<br>doctors/nurses/social<br>wkrs/other employed |              |           |       |              |           |       | 15.705       | (10.704)  | 0.164 |
| Observations  | 66           |           |       | 62           |           |       | 61           |           |       |
| R-squared   | 0.609        |           |       | 0.647        |           |       | 0.698        |           |       |
| Number of idhf2008  | 35           |           |       | 35           |           |       | 35           |           |       |

# PBF and HIV voluntary counseling and testing (VCT)

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- Information obtained from household surveys in the catchment areas of the facilities. Does it confirm results reported at the health facility level?
- All regressions control for socio-demographic variables (age, gender, education, marital status, asset values) and health facility fixed effects. Standard errors clustered at the district\*wave level.
- Individual voluntary counseling and testing (IVCT):  
“Have you ever been tested for HIV?”

# Balance at baseline

Table 1: Comparison of treatment and control: all adults

| Variable                         | Not married |      |         |      |       | Married   |      |         |      |       |
|----------------------------------|-------------|------|---------|------|-------|-----------|------|---------|------|-------|
|                                  | Treatment   |      | Control |      | p     | Treatment |      | Control |      | p     |
|                                  | mean        | SE   | mean    | SE   |       | mean      | SE   | mean    | SE   |       |
| <b>Female</b>                    | 0.63        | 0.04 | 0.61    | 0.04 | 0.671 | 0.59      | 0.04 | 0.52    | 0.04 | 0.261 |
| <b>Age, years</b>                | 28.63       | 1.92 | 29.09   | 1.66 | 0.861 | 37.84     | 0.85 | 40.92   | 0.87 | 0.029 |
| <b>Education</b>                 |             |      |         |      |       |           |      |         |      |       |
| No education                     | 0.25        | 0.01 | 0.19    | 0.02 | 0.037 | 0.33      | 0.06 | 0.36    | 0.05 | 0.616 |
| primary                          | 0.67        | 0.05 | 0.68    | 0.04 | 0.984 | 0.57      | 0.05 | 0.54    | 0.05 | 0.739 |
| secondary or higher              | 0.07        | 0.05 | 0.13    | 0.04 | 0.374 | 0.11      | 0.03 | 0.09    | 0.03 | 0.734 |
| <b>Marital status</b>            |             |      |         |      |       |           |      |         |      |       |
| divorced/widow                   | 0.31        | 0.07 | 0.27    | 0.06 | 0.683 | -         | -    | -       | -    | -     |
| never married                    | 0.69        | 0.07 | 0.73    | 0.06 | 0.683 | -         | -    | -       | -    | -     |
| <b>Log household asset value</b> | 11.64       | 0.38 | 11.57   | 0.32 | 0.884 | 11.93     | 0.25 | 12.05   | 0.22 | 0.734 |
| <b>Ever been tested</b>          | 0.42        | 0.06 | 0.38    | 0.05 | 0.679 | 0.69      | 0.03 | 0.65    | 0.03 | 0.451 |

# Results on individual VCT

Table2: Regression analyses on IVCT

| VARIABLES                        | All                 | Not Married         | Married             |
|----------------------------------|---------------------|---------------------|---------------------|
| PBF * Time (Phase I & Follow-up) | 0.052*<br>(0.027)   | 0.001<br>(0.053)    | 0.075**<br>(0.030)  |
| Follow-up (2008)                 | 0.137***<br>(0.032) | 0.169***<br>(0.052) | 0.103***<br>(0.023) |
| Observations                     | 2,049               | 1,238               | 811                 |
| Number of health facilities      | 24                  | 24                  | 24                  |



# Partner and couple's testing

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- Respondents who had sexual intercourse in past 12 months prior to the survey. Look at most recent partner.
- Partner's voluntary counseling and testing (PVCT)  
“Do you know if your partner has ever been tested for HIV? “.
- Couples' voluntary counseling and testing (CVCT) : combines IVCT and PVCT. A couple is considered tested for HIV if the respondent reported that he/she had ever been tested AS WELL AS his/her most recent partner.

# Partner and couple's testing: balance at baseline

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| CONTROL VARIABLES                         | Treatment<br>(N=208) |        | Control (N=202) |        | p      |
|---|----------------------|--------|-----------------|--------|--------|
|   | mean                 | SE     | mean            | SE     |        |
| <b>Female</b>                             | 0.5721               | 0.0546 | 0.5198          | 0.0495 | 0.4943 |
| <b>Age, years</b>                         | 34.7951              | 1.1904 | 37.7811         | 1.0862 | 0.0936 |
| <b>Education</b>                          |                      |        |                 |        |        |
| No education                              | 0.2637               | 0.0520 | 0.3041          | 0.0469 | 0.5765 |
| primary                                   | 0.6219               | 0.0420 | 0.6186          | 0.0402 | 0.9554 |
| secondary or higher                       | 0.1144               | 0.0333 | 0.0773          | 0.0301 | 0.4271 |
| <b>Marital status</b>                     |                      |        |                 |        |        |
| married                                   | 0.8829               | 0.0419 | 0.8469          | 0.0375 | 0.5365 |
| divorced/widow                            | 0.0634               | 0.0214 | 0.0765          | 0.0207 | 0.6688 |
| never married                             | 0.0537               | 0.0205 | 0.0765          | 0.0199 | 0.4418 |
| <b>Log household asset value</b>          | 11.9168              | 0.2617 | 11.803          | 0.2315 | 0.7514 |
| <b>Relationship with intimate partner</b> |                      |        |                 |        |        |
| spouse                                    | 0.8510               | 0.0580 | 0.8020          | 0.0503 | 0.5380 |
| domestic partner                          | 0.0288               | 0.0228 | 0.0644          | 0.0207 | 0.2751 |
| partner not living in the household       | 0.0529               | 0.0309 | 0.0891          | 0.0276 | 0.4024 |
| casual acquaintance                       | 0.0240               | 0.0069 | 0.0149          | 0.0081 | 0.4072 |
| others                                    | 0.0433               | 0.0105 | 0.0297          | 0.0116 | 0.4071 |
| <b>IVCT</b>                               | 0.7308               | 0.0382 | 0.6485          | 0.0368 | 0.1517 |
| <b>PVCT</b>                               | 0.7500               | 0.0573 | 0.6634          | 0.0508 | 0.2846 |
| <b>CVCT</b>                               | 0.6442               | 0.0441 | 0.5545          | 0.0415 | 0.1691 |

# Results on IVCT, PVCT and CVCT among sexually active individuals

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Table4: Regression analyses on PVCT and CVCT

| CONTROL VARIABLES                           | IVCT                | PVCT             | CVCT                |
|---|---------------------|------------------|---------------------|
| <b>PBF * Time (Phase I &amp; Follow-up)</b> | 0.058**<br>(0.026)  | 0.073<br>(0.051) | 0.104**<br>(0.038)  |
| <b>Follow-up (2008)</b>                     | 0.099***<br>(0.025) | 0.046<br>(0.030) | 0.078***<br>(0.028) |
| <b>Observations</b>                         | 857                 | 857              | 857                 |
| <b>Number of health facilities</b>          | 24                  | 24               | 24                  |

# Conclusions

- Results at the health facility level are confirmed with interviews at the household level.
- We found that PBF increased voluntary counseling and testing at the individual level in Rwanda.
- This effect is mainly found among married individuals
- We also found that PBF increased testing among couples, as reported by one of the 2 partners.
- PBF encouraged individual VCT (0.92 USD), but encouraged couples testing even more (4.59 USD).

# Next Steps

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- Effect of PBF on ARVs / program adherence
- Effect of PBF on other STIs, CD4 counts
- Collecting data on Community PBF with a quite different design from the HF