Cervical cancer screening in Ontario's primary care practice models: The influence of financial incentives

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Background

- Screening for cervical cancer with a Papanicolaou (Pap) smear is associated with lower risks of cervical cancer and related-mortality
- Ontario's target screening rate is 85%, but in 2009-2011 only 65% of women 20-69 were screened[1]
- Ontario's primary care reform in the early 2000s aimed to improve delivery of a basket of preventive healthcare services, including Pap smears, through alternative funding arrangements and bonuses
- Effects of incentives are variable, but in some cases demonstrate modest (<5%) improvement[2,3]

Table 1: Primary care practice models

	Fee-for-service (FFS)	Family Health Group (FHG)	Family Health Organization (FHO)
Remuneration	Traditional FFS: FFS payments without incentives	Enhanced FFS: FFS payments and incentives	Blended capitation: capitation fees, some FFS payments, and incentives
Formal patient enrolment	N/A	Required	Required
Bonus Eligibility	Ineligible	Eligible	Eligible

Pay-for-Performance (P4P) Incentives

- Cumulative Preventive Care Bonus for Pap smears awards physicians with stepped payments for delivering target levels of screening in a 30-month period to:
  - Enrolled female patients aged 35-69 years without prior hysterectomy

Study Objectives

1. Assess the outcome of the Cumulative Preventive Care Bonus for Pap smears
2. Examine the impact of physician remuneration on cervical cancer screening rates
3. Examine the costs of cervical cancer screening and bonus payments

Methodology

Study Sample

- Data were obtained from population-based administrative databases held at the Institute for Clinical Evaluative Sciences (ICES)
- Inclusion criteria: female patients aged 35-69 eligible for cervical cancer screening of primary care physicians practicing in a FFS, FHG or FHO on March 31st, 2011
- Exclusions: prior hysterectomy, gynecological cancer diagnoses or HIV infection

Outcomes

- Patient-level screening status assessed using a validated billing code algorithm[4]
- Bonuses paid to physicians

Statistical Analyses

- Fractional logit regression models were used to estimate physician practice screening rate adjusted for patient- and physician-level factors

$E(y_i) = g^{-1}(x_i\beta)$, $y_i \sim$ Bin $g(.)$ = logit y_i = physician practice screening rate

$x_i\beta = \beta_0 + \beta_1 practice_i + \beta_2 mean\_age_i + \beta_3 rural_i + \beta_4 deprivation_i + \beta_5 instability_i + \beta_6 ethnic\_concentration_i + \beta_7 physician\_sex_i + \beta_8 physician\_experience_i + \beta_9 screen\_practice\_size_i$

- Marginal effects were estimated using the method of recycled predictions[5]

Results

Table 2. Characteristics of study and outcomes

	FFS	FHG	FHO
Physicians	1,172 (16.1%)	2,847 (39.0%)	3,279 (44.9%)
Female*	36.3%	40.9%	42.1%
Mean years since graduation (95% CI)*	27.1 (26.3-27.9)	26.4 (26.0-26.8)	24.6 (24.3-25.0)
Mean screen eligible practice size (95% CI)*	185 (172-190)	293 (286-300)	315 (310-320)
Patients	216,609 (10.4%)	833,706 (40.0%)	1,033,318 (49.6%)
Mean age (95% CI)*	49.4 (49.3-49.4)	49.6 (49.6-49.6)	50.4 (50.4-50.4)
Rural*	6.1%	2.2%	7.5%
Cervical cancer screening rates (Figure 1)			
Mean unadjusted screening rate (95% CI)*	71.9% (71.7-72.1%)	82.6% (82.5-82.7%)	78.9% (78.8-79.0%)
Model predicted screening rate (95% CI)*	74.2% (73.9-74.4%)	81.9% (81.7-82.0%)	79.6% (79.4-79.8%)
Bonus payments (Figure 2)			
Bonuses claimed*	-	1,590 (55.85%)	2,657 (81.0%)
Annual bonus payments*	-	$2,660,240	$4,534,640
Cost per woman screened (Figure 3)			
Average cost*	$18.30	$29.71	$35.02

* $p < 0.05$

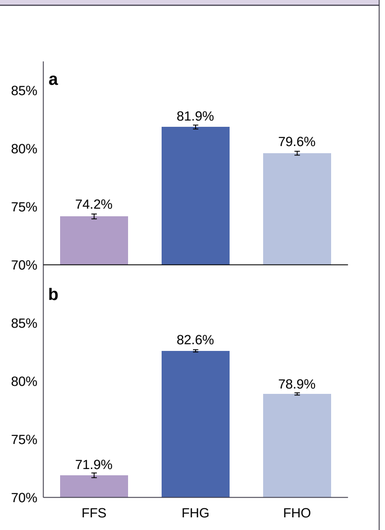

Figure 1: (a) unadjusted and (b) model predicted cervical cancer screening rates

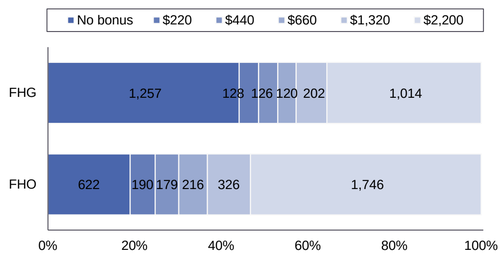

Figure 2: bonuses claimed by FHG and FHO physicians for cervical cancer screening participation in 2011

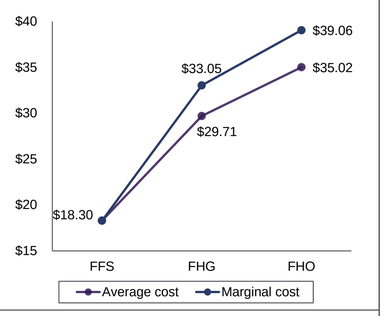

Figure 3: average and marginal cost per woman screened by primary care practice model. Note that costs in the FFS model include Pap smear delivery costs only, whereas costs in the FHG and FHO include delivery costs and bonus payments.

Conclusions

Discussion

- Among physicians reimbursed on a FFS basis, those eligible for incentives (FHG) had significantly higher screening rates than physicians who are not eligible
- Physicians in a blended capitation model with incentives (FHO) had significantly higher screening rates than FFS physicians and slightly lower rates than those in the FHG
- Our results suggest that incentive eligibility has an impact on cervical cancer screening rates, but the effect of physician remuneration scheme is negligible
- Costs were lowest in the FFS model and highest in the FHO where one in two (53%) claimed the highest award level
- Our results are generally consistent with past research suggesting that P4P incentives have modest effects on cervical cancer screening rates[2]

Limitations

- Unable to assess temporal trends
- Possible selection bias due to physicians self selecting a reformed model
- FHO screening rates may be biased downward if physicians do not submit shadow billings

Strengths

- We examined the influence of incentives in different models with distinct funding arrangements, whereas prior research of incentives in Ontario grouped all reformed models together[3,5]
- Our analysis examined both performance and costs to provide a more complete understanding of the impact of the Cumulative Preventive Care Bonus

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Acknowledgements

Funding for this research by the Canadian Institutes of Health Research Operating Grant MOP-130454 (Do primary care reforms influence physician performance and patient outcomes? Econometric analyses of Ontario's primary healthcare delivery models) is gratefully acknowledged. This study was supported through provision of data by the Institute for Clinical Evaluative Sciences (ICES) and Cancer Care Ontario. We would like to thank Dr. Salimah Shariff and ICES Western for access to conduct these analyses and Dr. Rick Glazier, Alex Kopp and Nathaniel Jembere from ICES Central.