Urban and rural differences among primary care physicians (PCPs) in the diagnostic work-up of patients with suspected cancer

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OBJECTIVE

To examine urban/rural differences among PCPs in the diagnostic work-up of patients with suspected cancer.

METHODS

This study was part of the International Cancer Benchmarking Partnership, a larger study comprised of 5 modules examining reasons for observed differences in cancer survival among participating countries.

In Ontario, PCPs registered with the College of Physicians and Surgeons of Ontario were invited to participate in Module 3 of the ICBP study, a cross-sectional online survey examining PCP practices and beliefs as they relate to the diagnosis and management of cancer.

The survey included 22 questions examining PCP beliefs, administrative practices, appointment organization, access to diagnostic investigations, and two randomly presented vignettes (of five; 2 lung, 2 colorectal and 1 ovarian) where PCPs were asked to describe their diagnostic work-up for a patient presenting with symptoms that may suggest cancer.

Urban/rural status was determined using the 2011 Canadian Census. Urban/rural differences in diagnostic work-up were examined using chi-square testing, while differences in willingness to refer patients to secondary care, or to order an appropriate diagnostic investigation (i.e. chest X-ray/CT/MRI for lung cancer; abdominal CT / colonoscopy for colorectal cancer; and ultrasound /abdominal CT for ovarian cancer) *at* the first and *by* the second primary-care visit were examined using logistic regression.

RESULTS

578/2964 (19.5%) eligible PCPs responded between December 2012 and March 2013 (urban: n=326/2094 (15.6%); rural: n=252/870 (29.0%)).

Urban/rural differences among PCPs in the diagnostic work-up of patients were predominantly non-statistically significant ($p<0.05$). Where differences were statistically significant, no trends across vignettes were observed.

In regards to PCP willingness to refer/investigate, 71.6% of PCPs presented with the ovarian vignette referred/investigated at the first visit, compared to approximately half (40.9 to 51.8%) and one-quarter (23.8 to 25.5%) for the lung and colorectal vignettes respectively. The majority of PCPs referred/investigated by the second visit for all five vignettes (73.4 to 99.3%).

After adjustment for PCP sex and year medical degree was obtained, urban/rural differences in PCP willingness to refer/investigate *at* the first visit, and *by* the second visit were non-statistically significant for all 5 vignettes.

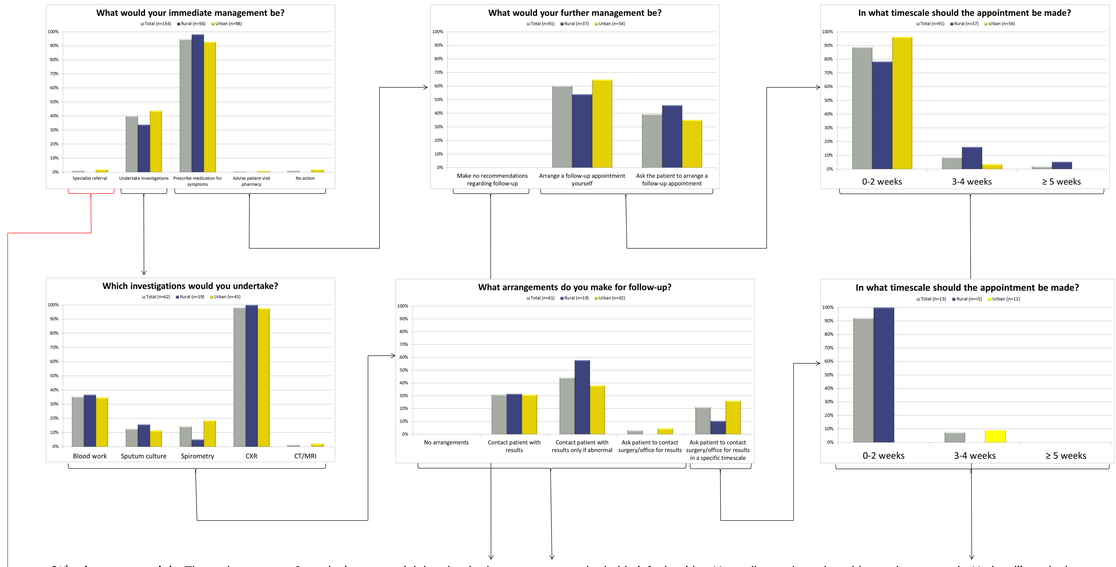
CONCLUSIONS

There appear to be no clinically important urban/rural differences among PCPs in the diagnostic work-up of patients with suspected cancer. Where differences were observed, there were no underlying similarities consistent across vignettes.

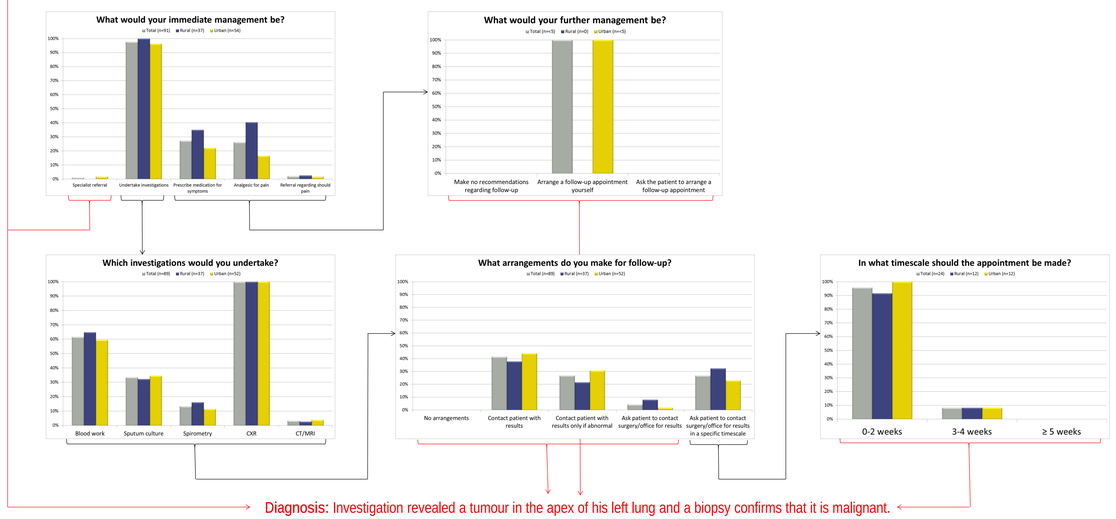
Differences however among PCPs in the diagnostic work-up of patients were observed between cancer sites.

LUNG VIGNETTE 2 FLOW DIAGRAM

1st primary care visit: You are consulted by a 62 year old male smoker with COPD, diagnosed by spirometry 2 years previously. He has smoked 20 cigarettes/day for over 40 years. His current medication is tiotropium inhaler 1 puff daily and salbutamol inhaler for use as required. There is no other relevant past medical history. He presents with a 1 week history of an URTI with increased sputum production and increased use of his inhaler. On examination he is not cyanosed, had a normal respiratory rate, but he has some crepitations at the left base and some upper lobe wheeze (rhonchi) bilaterally.



2nd primary care visit: The patient returns 3 weeks later complaining that he has a constant ache in his left shoulder. He attributes the pain to his persistent cough. He is still producing grey coloured sputum in larger quantities than usual but he has no other chest symptoms. There is no weight loss. On examination he still has bilateral upper lobe wheeze and some crepitations at the left base. Examination of his shoulder is normal.



Diagnosis: Investigation revealed a tumour in the apex of his left lung and a biopsy confirms that it is malignant.

Table 1: PCP willingness to refer to secondary care / order an appropriate [1] diagnostic investigation by PCP urban/rural status

	n (%)	n (%)	n (%)		OR (95% CI)[2]
Lung Vignette 1:	**Total (n=297)**	**Rural (n=90)**	**Urban (n=207)**		
Referred/Investigated *at* 1st visit					
Yes	154 (51.8%)	44 (48.9%)	110 (53.1%)	Urban	1.00
No	143 (48.2%)	46 (51.1%)	97 (46.9%)	Rural	1.17 (0.71, 1.93)
Referred/Investigated *by* 2nd visit					
Yes	294 (99.0%)	89 (98.9%)	205 (99.0%)	Urban	n/a [3]
No	< 5 (1.0%)	< 5 (1.1%)	< 5 (1.0%)	Rural	
Lung Vignette 2:	**Total (n=154)**	**Rural (n=56)**	**Urban (n=98)**		
Referred/Investigated *at* 1st visit					
Yes	63 (40.9%)	19 (33.4%)	44 (44.9%)	Urban	1.00
No	91 (59.1%)	37 (66.1%)	55 (55.1%)	Rural	1.68 (0.83, 3.39)
Referred/Investigated *by* 2nd visit					
Yes	153 (99.3%)	56 (100.0%)	97 (98.9%)	Urban	n/a [3]
No	< 5 (0.7%)	0 (0.0%)	< 5 (1.1%)	Rural	
Colorectal Vignette 3:	**Total (n=282)**	**Rural (n=102)**	**Urban (n=180)**		
Referred/Investigated *at* 1st visit					
Yes	67 (23.8%)	25 (24.5%)	42 (23.3%)	Urban	1.00
No	215 (76.2%)	77 (75.5%)	138 (76.7%)	Rural	0.95 (0.53, 1.69)
Referred/Investigated *by* 2nd visit					
Yes	207 (73.4%)	72 (70.6%)	135 (75.0%)	Urban	1.00
No	75 (26.6%)	30 (29.4%)	45 (25.0%)	Rural	1.25 (0.72, 2.18)
Colorectal Vignette 4:	**Total (n=141)**	**Rural (n=44)**	**Urban (n=97)**		
Referred/Investigated *at* 1st visit					
Yes	36 (25.5%)	14 (31.8%)	22 (22.7%)	Urban	1.00
No	105 (74.5%)	30 (68.2%)	75 (77.3%)	Rural	0.59 (0.26, 1.33)
Referred/Investigated *by* 2nd visit					
Yes	123 (87.2%)	39 (88.6%)	84 (86.6%)	Urban	1.00
No	18 (12.8%)	5 (11.4%)	13 (13.4%)	Rural	0.81 (0.26, 2.49)
Ovarian Vignette 5:	**Total (n=275)**	**Rural (n=89)**	**Urban (n=186)**		
Referred/Investigated *at* 1st visit					
Yes	197 (71.6%)	63 (70.8%)	134 (72.0%)	Urban	1.00
No	78 (28.4%)	26 (29.2%)	52 (28.0%)	Rural	0.97 (0.54, 1.74)
Referred/Investigated *by* 2nd visit					
Yes	238 (86.5%)	75 (84.3%)	163 (87.6%)	Urban	1.00
No	37 (13.5%)	14 (15.7%)	23 (12.4%)	Rural	1.21 (0.57, 2.55)

[1] *An appropriate diagnostic investigation was defined as: Chest x-ray, CT, MRI for the lung vignettes; abdominal CT or colonoscopy for the colorectal vignettes; and ultrasound or abdominal CT for the ovarian vignette*
[2] *All results are adjusted for sex of the PCP and year the PCP's medical degree was obtained*
[3] *'n/a' indicates that there was not enough variability to conduct logistic regression*

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