Patient morbidity and management patterns of community-based primary health care services in Hong Kong

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Key Messages

1. The most common reason for doctor consultation was upper respiratory tract infection (26.4%), followed by hypertension (10.0%), diabetes (4.0%), gastroenteritis (3.9%), and lipid disorder (2.7%).
2. Imbalance of care was evident between the private and public primary care sectors; the public sector was heavily burdened with care for patients with chronic diseases. There is room to expand the role of private sector in primary care for chronic diseases and in disease prevention.
3. Funding methods and training in family medicine was associated with morbidity and management patterns.
4. These findings could guide health care policy and resource allocation as well as the content of medical training programmes.

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Introduction

Population ageing and changes in the socioeconomic structure affect the disease pattern. Chronic diseases and psychological illnesses are major health care burdens in the 21st century.[1] Primary care doctors are taking care of an increasing load of patients with chronic illness.[2]

This study aimed to explore the patterns of diseases and their management presenting to primary care doctors in Hong Kong, and whether different funding methods had an effect on these patterns.

Methods

This study was conducted from June 2007 to February 2009. Primary care doctors from both private and public sectors were invited to take part. Patient demographics, payment method, diagnosis, nature of the illness (acute, chronic, preventive or administrative), and management (prescription, investigation, referral, and preventive activities) were recorded using standardised forms for patients presenting from July 2007 to June 2008. Diagnoses were coded using the International Classification of Primary Care (ICPC-2) developed by the World Organization of Family Doctors.[3] Doctor demographics, type and years of practice, training, and postgraduate qualifications were recorded on a separate form.

Patient morbidity and management patterns were presented as percentage distribution. Multivariate regression analyses were performed to examine the relationship between payment method and nature of illness, investigation and referral patterns, and practice sectors and management pattern, with adjustment of confounding factors such as patient and doctor demographics, the nature of illness, the number of years the doctor in general practice, training in family medicine, and postgraduate qualification.

All estimates were accompanied with a 95% confidence interval. A P value of <0.05 was considered statistically significant.

Results

A total of 109 doctors (of whom 67 had family medicine training) participated in the survey. They recorded 52 337 patient encounters and 69 973 health problems. As the public sector was over-represented, the cross-sectional data was weighted to simulate the private and public primary care service utilisation ratio, as reported by the general population study on service utilisation patterns in Hong Kong in 2007-08.[4]

Overall patient morbidity patterns in primary care in Hong Kong

The most common reason for consultation was upper respiratory tract infection (26.4%), followed by hypertension (10.0%), diabetes (4.0%), gastroenteritis (3.9%), and lipid disorder (2.7%). Table 1 shows the top 10 health problems by age-groups. Upper respiratory tract illness was commonest in all age-groups, except in the elderly, where it came second (10.8%) following hypertension (23.7%).

In the elderly, chronic diseases were commonest and accounted for >50% of all health problems. Hypertension, diabetes, and lipid disorder together accounted for almost 25% of all health problems in adults. Hypertension ranked ninth among young adults, accounting for 1.4%. Over 70% of all health problems in the children and over 50% in adolescent and young adults were acute in nature. In terms of psychological problems, anxiety accounted for 1.1% in adults, 1.0% in young adults, and 0.6% in the elderly, whereas depression accounted for 0.7% in young adults, 0.9% in adults, and 0.5% in the elderly. In terms of preventive care, immunisation was in the top 10 for all age-groups (except in the elderly [1.3%]), as was physical check-up in young adults (2.7%) and adults (1.9%), but only 0.5% in the elderly.

Table 2 shows the age-sex distribution of the patient population, payment method, nature of health problems, and workload by practice sectors. Doctors in the public sector encountered more elderly patients and those with chronic illness. They also encountered significantly more health problems per encounter and had a heavier workload than those in the private sector. Chronic illnesses with significant morbidity and mortality, such as hypertension (25.7%), diabetes (10.4%), lipid disorder (5.3%), cerebrovascular disease (2.3%), ischaemic heart disease (1.5%), osteoarthritis (1.7%), and chronic obstructive pulmonary disease (0.9%), accounted for almost half of all problems encountered in the public sector, but were less frequently in the private sector. Preventive care (such as immunisation and physical check-up) was more commonly performed in the private sector, accounting for 2.6% and 2.3% of all health problems, respectively. Anxiety and depression accounted for 1.1% and 0.8% of health problems, respectively, in the private sector, compared to only 0.2% and 0.4% in the public sector. Moreover, doctors with family medicine training were more involved in chronic disease care than doctors without such training.

Management pattern in primary care in Hong Kong

Table 3 summarises overall management patterns in primary care services in Hong Kong and those in the private and public sectors. Almost 90% of all encounters resulted in a prescription. The overall prescribing rate for antibiotics was 11.0% and those of benzodiazepines, the non-benzodiazepine or 'Z' hypnotics, and antidepressants were low. Investigations (including all types of blood tests, microbiology tests, and imaging) were ordered in 9.0% of all encounters. In the private sector, 34.8% of all encounters entailed investigations for acute problems, 26.9% for preventive care (such as physical check-ups), and only 21.0% for chronic problems. However in the public sector, 60.0% of the encounters entailed investigations for chronic problems, 22.6% for acute problems, and only 0.1% for preventive care.

To a certain extent, referral rates can reflect the need for other health care services. The overall referral rate was 3.6%; the referral rate to specialist care was 2.5%, to allied health professionals was 0.7%, and to emergency departments and for hospital admission was 0.3%. Most referrals were made to surgery (16.8%), followed by physiotherapy (14.1%), ophthalmology (11.4%) and internal medicine (10.0%). Within medical disciplines, most referrals were to surgery, ophthalmology, and internal medicine, from both the private and public sectors. Physiotherapy was the major allied health service receiving referrals from both the private and public sectors. Public sector doctors also referred patients to occupational therapy and dietetics.

Preliminary results also showed that doctors with family medicine training prescribed fewer drugs per encounter than

Table 1. Top 10 health problems encountered during consultation among different age-groups

Top 10 health problems encountered (%)				
Paediatrics	Adolescents	Young adults	Adults	Elderly
Upper respiratory tract illness (52.1)	Upper respiratory tract illness (41.9)	Upper respiratory tract illness (34.9)	Upper respiratory tract illness (19.4)	Hypertension (23.7)
Immunisation, acute bronchitis (6.0)	Gastroenteritis (7.6)	Gastroenteritis (6.0)	Hypertension (13.9)	Upper respiratory tract illness (10.8)
Gastroenteritis (4.8)	Dermatitis (4.1)	Dermatitis (3.2)	Diabetes (6.0)	Diabetes (8.9)
Dermatitis (4.2)	Allergic rhinitis (3.3)	Physical check-up (2.7)	Lipid disorder (4.5)	Lipid disorder (5.0)
Influenza (2.6)	Acute bronchitis (3.1)	Acute bronchitis (2.3)	Gastroenteritis (2.5)	Osteoarthritis, cerebrovascular disease (2.4)
Allergic rhinitis (2.1)	Influenza (3.0)	Immunisation (2.0)	Acute bronchitis, dermatitis (2.1)	Dermatityis (1.9)
Asthma (1.6)	Immunisation (2.5)	Allergic rhinitis (1.6)	Physical check-up (1.9)	Gout (1.8)
Acute tonsillitis, infectious conjunctivitis (1.3)	Acne (2.1)	Abdominal pain (1.5)	Dyspepsia (1.5)	Ischaemic heart disease (1.7)
Acute otitis media, skin infection, chickenpox, abdominal pain, cough (0.7)	Acute tonsillitis (1.6)	Influenza, hypertension (1.4)	Immunisation, abdominal pain (1.2)	Acute bronchitis (1.6)
Blepharitis/stye/chalazion, other viral rash/disease, urticaria (0.6)	Abdominal pain (1.5)	Dyspepsia, acute tonsillitis (1.2)	Anxiety, test results (1.1)	Benign prostatic hypertrophy (1.4)

those without such training. They had a lower prescribing rate for antibiotics, benzodiazepines, the 'Z' hypnotics, and antidepressants; and had higher investigation and referral rates.

Potential effects of funding on management pattern in the private sector

As primary care in the public sector is heavily subsidised by the government, only the possible effects of the funding method in the private sector were explored. This included: how likely patients consulted for acute problems, chronic problems, and preventive care, and how likely their management would entail investigations and referrals. Comparison was made between consultations in which patients paid out of their own pockets as opposed to being reimbursed. Logistic regression analyses showed that patients who were reimbursed were more likely to consult for both acute and chronic problems, and were less likely to consult for preventive care. They were also more likely to have investigations ordered and be referred to other services.

Discussion

Primary care doctors are often the first point of contact of care and encounter problems at an early, undifferentiated

Table 2. Age-sex distribution, encounter characteristics, and workload by practice sectors

Variable	No. (%) of encounters		
	Private sector (n=38 414)	Public sector (n=13 923)	Total (n=52 337)
Mean (SD) age (years)*	38.7 (20.7)	57.0 (19.6)	43.5 (21.9)
Female:male ratio	1.4:1	1.3:1	1.4:1
Age-group (years)			
0-9	3904 (10.2)	486 (3.5)	4392 (8.4)
10-19	2710 (7.1)	386 (2.8)	3097 (5.9)
20-44	17 173 (44.7)	1929 (13.9)	19 112 (36.6)
45-64	9983 (26.0)	5789 (41.6)	15 725 (30.1)
≥65	4541 (11.8)	5362 (38.5)	9904 (19.0)
Payment method			
Out of pocket	23 177 (60.6)	9163 (65.9)	32 340 (62.0)
Insurance/employer cover	14 367 (37.6)	1757 (12.6)	16 124 (30.9)
Government assistance	275 (0.7)	2983 (21.5)	3258 (6.2)
Others	404 (1.1)	2 (0.0)	406 (0.8)
Nature of health problems	n=45 639	n=24 334	n=69 973
Acute	33 045 (72.5)	8121 (33.4)	41 166 (58.9)
Chronic	9014 (19.8)	16 031 (65.9)	25 045 (35.8)
Preventive	3428 (7.5)	162 (0.7)	3590 (5.1)
Administrative	90 (0.2)	13 (0.1)	103 (0.1)
No. of health problems per encounter*	1.2	1.7	1.3
No. of doctors	80	29	109
Mean (SD) working hours per day*	8.1 (1.5)	7.6 (0.6)	8.0 (1.3)
Mean (SD) No. of encounters per day*	33.7 (16.8)	57.5 (14.8)	40.0 (19.3)
Mean (SD) No. of encounters per hour*	4.2 (2.0)	7.6 (2.2)	5.1 (2.5)
Mean (SD) length of consultation (minutes)*	18.3 (11.4)	8.7 (3.2)	15.8 (10.7)

* P<0.05 between private and public sectors by independent sample *t* test

Table 3. Management pattern by practice sectors

Variable	No. (%) of encounters		
	Private sector (38 414)	Public sector (13 923)	Total (52 337)
No. of drugs prescribed per encounter			
Nil	4543 (12.2)	765 (5.6)	5308 (10.4)
1-3	15 629 (41.9)	7940 (57.9)	23 569 (46.2)
4-6	16 240 (43.5)	4390 (32.0)	20 630 (40.4)
>6	887 (2.4)	628 (4.6)	1515 (3.0)
Prescription			
Antibiotics	5357 (13.9)	386 (2.8)	5743 (11.0)
Benzodiazepines	570 (1.5)	38 (0.3)	608 (1.2)
'Z' hypnotics	292 (0.8)	5 (0.0)	297 (0.6)
Antidepressants	464 (1.2)	82 (0.6)	546 (1.0)
Investigation ordered	2769 (7.2)	1957 (14.1)	4726 (9.0)
Referral			
Overall	1203 (3.1)	681 (4.9)	1884 (3.6)
Specialist	856 (2.2)	457 (3.3)	1313 (2.5)
Hospital admission/accident & emergency department	104 (0.3)	57 (0.4)	161 (0.3)
Allied health	202 (0.5)	147 (1.1)	349 (0.7)
Preventive care			
Physical measurement	14 033 (36.5)	6956 (50.0)	20 989 (40.1)
Lifestyle advice	10 444 (27.2)	4935 (35.4)	15 379 (29.4)
Vaccination advice	1931 (5.0)	601 (4.3)	2532 (4.8)
Cancer screening	912 (2.4)	154 (1.1)	1066 (2.0)
Others	1865 (4.9)	957 (6.9)	2822 (5.4)

stage where a definite diagnosis cannot be made. Our findings reflect the diversity of health problems presented to primary care doctors. Primary care doctors are taking care of an increasing load of patients with chronic illness, as population is ageing. In our study, the overall prevalence of hypertension, diabetes, and lipid disorder were 10.0%, 4.0%, and 2.7%, respectively, compared to 6.6%, 2.6%, and 0.4% in the 1994 survey. Patients with these chronic conditions are prone to develop complications, particularly ischaemic heart disease and cerebrovascular disease among the elderly. Hypertension was one of the 10 commonest reasons for consultation in young adults. In the public sector, diabetes accounted for 2.9% of all health problems in this group. The high prevalence of these chronic disorders may raise the public's awareness to promote healthy lifestyle, early detection, continual monitoring, and early detection of complications, as well as the provision of support services.

In our study, the prevalence of respiratory allergic diseases and mental health problems may not be reflected accurately, as patients with these conditions could be under the care of specialists or these conditions may be prone to misdiagnosis or under-diagnosis. Further studies are warranted to reveal their true prevalence.

Primary care doctors are taking a greater role in preventive care; immunisation and physical check-ups together accounted for 3.6% of all encounters as compared to only 1.7% in the 1994 survey. Nonetheless, with physical check-up accounting for 2.7% of all encounters in the young adults, further studies should be conducted to explore their cost-effectiveness.

Differences in morbidity and management patterns and workload were observed between the private and public sector. Primary care doctors in the public sector encountered more chronic health problems, more health problems per encounter, and rarely performed preventive care. This can be explained by the difference in the appointment system, the nature of service provided, and the fees structure in private and public sectors. The investigation rate was much higher in the public than the private sector; most investigations were ordered for patients with chronic illness. Although the study design did not allow for the differentiation of the types of investigation ordered, sub-analysis of data may provide more information on the health problems. The overall prescribing rates for antibiotics and psychotropic drugs were generally low. The true prevalence of mental problems were likely to have been underestimated. Further studies on the type of antibiotics prescribed, their dosage and course duration are needed, as these have implications on the rational use of antibiotics and the containment of antibiotic resistance. The overall referral rate was low, indicating that most of the presenting health problems could be managed in primary care alone. The rate may be under-estimated as patient self-referral and specialist-to-specialist cross referral were not taken into account. Nonetheless, to a certain extent it reflects the demand for access to other health care services. There was a significant difference in the allied health service referral rates between the private and public sectors. This could be explained by the more readily available and much cheaper allied health services in the public sector. Further studies are needed to examine whether there is any service gap in the private sector. Sub-analysis of the data is also needed to explore what problems resulted in referrals.

In patients whose medical fee could be reimbursed, they were more likely to consult for their health problems, have investigation ordered, and be referred to other health professionals. However, they were less likely to consult for preventive care, as the costs of preventive care were not reimbursable. Our methodology could not capture payment methods related to various medical benefit schemes, the extent of co-payment or deductibles, and other third-party payments.

Doctors with family medicine training were more involved in chronic care, and their management behaviour differed from those without such training. Further regression analyses should be performed to explore the effects of family medicine training on management behaviour.

Limitations

In the Hong Kong health care system, the service utilisation pattern is complex. There are various types of primary care services available including specialist care. This complex pattern may influence estimates of symptom prevalence and disease frequency.

Variations between diagnoses made by different doctors, or by the same doctor on different occasions were bound to occur. Discrepancies in diagnostic coding can be minimised by conducting ICPC workshops and providing doctors with ICPC-2 pages (in which common health problems were highlighted and explanatory notes provided).

This study relied on the voluntary participation of doctors; we therefore need to balance the comprehensiveness of data collected against doctors' busy clinic workload. Some data collected were very crude (for example payment method, types of drugs prescribed, and types of investigation ordered).

We can only elucidate associations, but not causality between payment methods and consulting or management patterns, as analyses were based on cross-sectional data. Other factors such as patient-doctor relationship, the doctor's training and qualification may also have an influence. Further studies, such as qualitative research, are required to explore the effect of the payment method on the choice of primary care providers, patient consultation behaviour, subsequent management, and whether other influences are present.

Conclusions

Primary care doctors are taking care of an increasing

load of patients with chronic illness; the public sector is heavily burdened with chronic disease care. There is room for expanding the private sector role in primary care for chronic disease and preventive care. As in other developed countries, more younger persons are diagnosed with chronic illness such as hypertension and diabetes. This is a public health concern. The scope of mental health problems may not be truly reflected.

The funding method may be associated with the way patients consult their doctors. Those whose medical fees were reimbursed were more likely to consult for health problems than those who pay out of pocket. These schemes had shortcomings in health promotion as they only reimbursed treatment care and not preventive care.

The current patient morbidity and management patterns in primary care in Hong Kong provide an insight on the health care services needs in our population. This information should be used to guide the content of the undergraduate medical curriculum and family medicine vocational training programmes. Further prospective studies examining the effects of various payment schemes on service utilisation pattern in the private sector may help to identify ways to galvanise chronic and preventive care in the private sector, where the bulk of primary care takes place.

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