ORIGINAL ARTICLE

A report on a randomly sampled questionnaire survey about renal stone disease in Hong Kong

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Objectives To investigate the prevalence and characteristics of patients with renal stone in Hong Kong, and awareness of corresponding prevention strategies.

Design Telephone public survey.

Setting Hong Kong community.

Participants A public telephone survey concerning the occurrence of renal stone disease and the public awareness of the condition was performed. Respondents whose telephone numbers were randomly selected by computer and the family member of the household who had the closest birthday to that date was chosen for interview. Data collected were further adjusted for the gender and age distribution of the Hong Kong population in mid-2007.

Results A total of 1010 Hong Kong citizens aged 18 years or above were successfully interviewed in November 2007. Among them, 25 respondents themselves had a history of renal stones, yielding a point prevalence of 2.5%. In addition, 70 respondents had family members with a history of renal stones, yielding an estimated household point prevalence of 6.9%. Stone patients were mainly older, male, and imbibed less fluids than the average for all respondents. The public's concepts with regard to the diet necessary and the importance of taking more fluid to prevent stone formation was poor.

Conclusion Hong Kong has a relatively low prevalence of renal stone disease, compared to neighbouring areas. However, the local public and affected patients had little knowledge and awareness about this important health problem.

Key words
Demography; Food habits; Kidney calculi; Prevalence; Primary prevention

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Introduction

Renal stone (nephrolithiasis) is a common problem. The occurrence of renal stone is usually believed to be due to crystallisation of minerals inside urine, which act as the nidus for more sedimentation and finally the formation of a stone within the kidney. The potential health threat of such urinary stones include: renal colic, urinary tract infection, obstruction of the collecting system, renal damage, and ultimately renal failure and even death.

Since the characteristics of the urine (eg concentration of the various minerals and chemicals) are directly related to the formation of the urinary stones, fluid intake and diet can affect the chance of such an occurrence.[1,2] In addition, identified risk factors for urinary stone formation include: family history,[3] occupations involving manual work,[4] socio-economic profiles,[5] diet,[6,7] and reduced fluid intake.[8,9] Thus, more awareness of the necessary fluid and dietary intake could reduce the chance of urinary stone formation.

It is also known that the prevalence of nephrolithiasis varies with age,[10,11] gender, and race.[12] In Asia the prevalence is apparently lower than that in Europe and in North America.[10,13-18] To our knowledge, there is no such information about renal stone disease in Hong Kong and the aim of the present survey was to investigate local prevalence and characteristics of patients developing urinary stones and awareness of prevention strategies.

Methods

The Hong Kong Society of Endourology (HKSE) invited the Public Opinion Programme

香港腎結石病隨機抽樣問卷調查報告

目的 研究香港腎結石病人的普遍程度和特點，以及他們對相關預防措施的意識。

設計 公眾電話訪問調查。

安排 香港社區。

參與者 電話調查腎結石病的普遍程度和公眾對有關情況的意識。受訪家庭的電話號碼由電腦隨機選出，家庭成員之中生日與調查日期最接近的，被選作訪問對象。所得的數據按照香港2007年中期人口的性別和年齡分佈再調整。

結果 2007年11月，調查成功訪問了1010名18歲或以上的香港市民。受訪者中25名曾患有腎結石，現患率為2.5%。70名受訪者的家庭成員曾患腎結石，估計家庭現患率為6.9%。腎石病人以年長者和男性為主，他們的流質飲用量也較全體受訪者平均的液體飲用量為低。而公眾對預防腎結石所必要的飲食習慣和多飲用流質的重要性，認識相當薄弱。

結論 香港與鄰近地區比較，腎結石病的普遍程度相對低。但是，公眾和受影響的病人對這個重要的健康問題所知有限和意識不高。

of the University of Hong Kong (HKUPOP) to undertake a telephone survey into the occurrence of renal stone disease and the public awareness about this condition. The questionnaire (Appendix) was designed by members of the HKSE and the HKUPOP. Initially a questionnaire was designed in English, and subsequently translated into Chinese for use by HKUPOP field workers. The core of the questionnaire consisted of three major parts: the first (for all respondents) focused on fluid intake and knowledge about the relevance of fluid and diet on stone formation. The second was directed at respondents with a history of renal stone disease, with particular reference to the care they received for their problem. To recruit a larger sample, it also sought information about households in which family members had a history of urinary stones. The third and last part addressed the demographic data pertaining to the respondents.

The telephone survey was carried out by HKUPOP in November 2007. Telephone numbers were randomly selected by computer and calls were made during evening hours so as to avoid biasing the respondents selected due to working. The respondents were further selected by choosing the family member of the household who had the closest birthday to that date. The subsequent statistical analysis was performed by the HKUPOP. Data collected were adjusted, based on the gender and age distribution of the Hong Kong population in mid-2007.

Results

The telephone survey was conducted between 1 and 14 November 2007. A total of 1010 Hong Kong citizens aged 18 years or above were successfully interviewed. The overall response rate was 67.6%. Among them, 25 respondents had a history of renal stones, amounting to a point prevalence of 2.5%. In addition, 70 respondents had family members with a renal stone history, yielding an estimated household point prevalence of 6.9%. The ratio of male-to-female respondents was 1:1.1; the mean age of all the respondents was 45 years. The mean age of the 25 respondents with a stone history was 56 years.

Certain epidemiological characteristics of the 25 respondents with stone disease appeared to differ from those of the general population of respondents. The male-to-female ratio was 3:2, and the commonest age-group was 50 to 59 years, which was older than that in the general population of respondents.

Respondents with stone disease also tended to be manual workers and had a relatively lower education level (Fig 1).

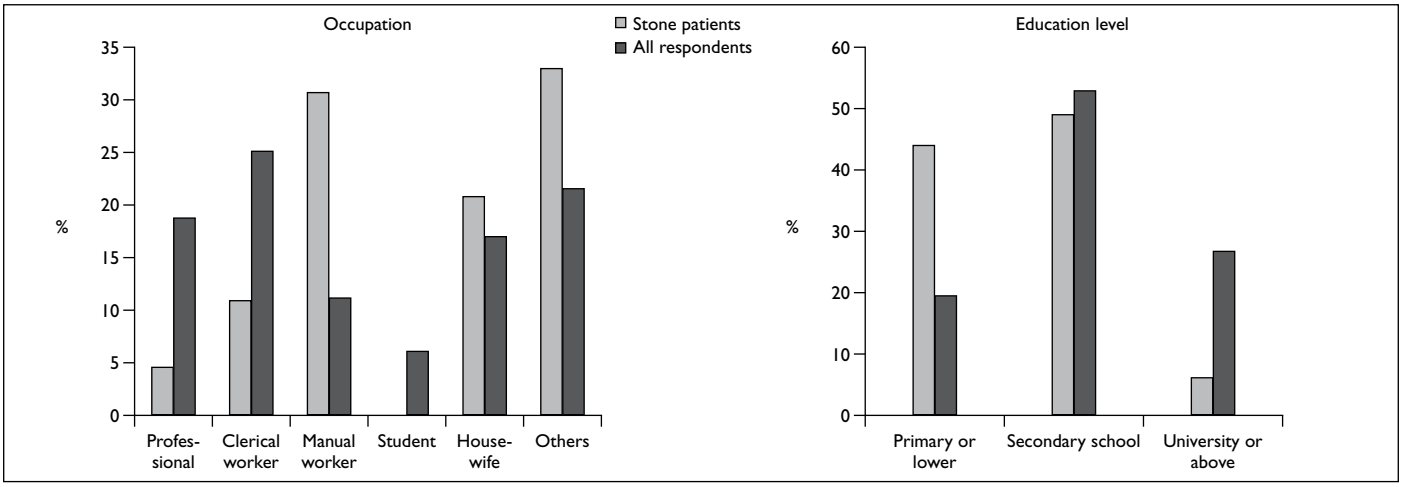

FIG 1. Epidemiological characteristics

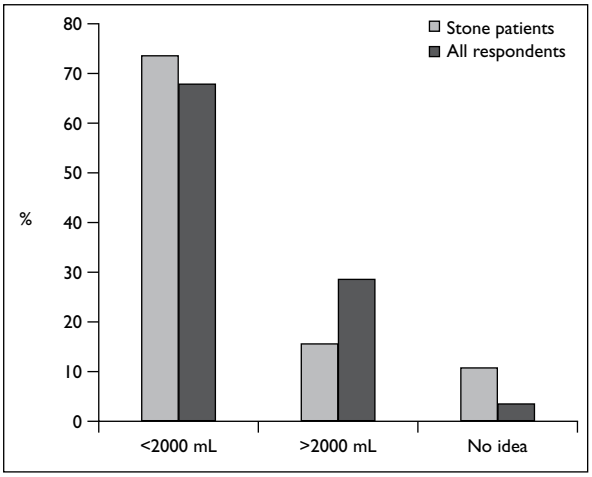

FIG 2. Daily fluid intake pattern

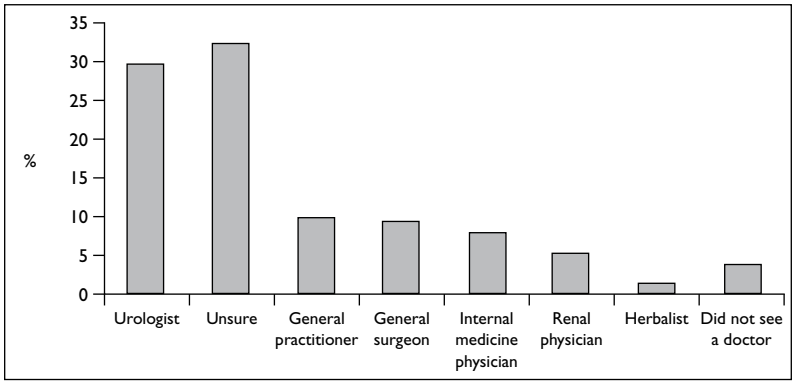

FIG 3. Consultation pattern of the respondents/family members with stones

All respondents were asked about their daily fluid intake (Fig 2). The proportion of taking less than 2 L a day was 73% among those with stones and 68% for all respondents. In addition, 11% of the respondents with stones had no idea of their daily fluid intake compared to 4% among all respondents. However, it should be noted that because the sample size of stone patients was small, these analyses did not yield statistically significant differences. The quoted figures should therefore be considered as rough estimates only.

The second part of the questionnaire was designed to assess the consultation pattern and the care received by respondents with stone disease. In anticipation of the sample size of such respondents, the investigators also inquired into family household members of respondents in the survey.

When asked about who was consulted about urinary stones, it appeared that 95 subjects had identified 103 persons (Fig 3). Thus, 30% had consulted a urologist, and 32% were unsure about the specialty of the doctor. Other common answers included: general practitioners (10%), general surgeons (9%), internal medicine physicians (8%), and renal physicians (5%).

In all, 93 subjects (two did not answer this question) gave a total of 111 answers about the imaging investigations that they had had, and 95 claimed to have undergone 135 treatments (Fig 4).

Moreover, 79 subjects reported their understanding about the effects of treatment: 71% stated their stones were completely cleared, 12% enjoyed partial clearance. In 9%, treatment had failed and about 8% were uncertain about the effects of the treatment.

In response to the third part of the questionnaire

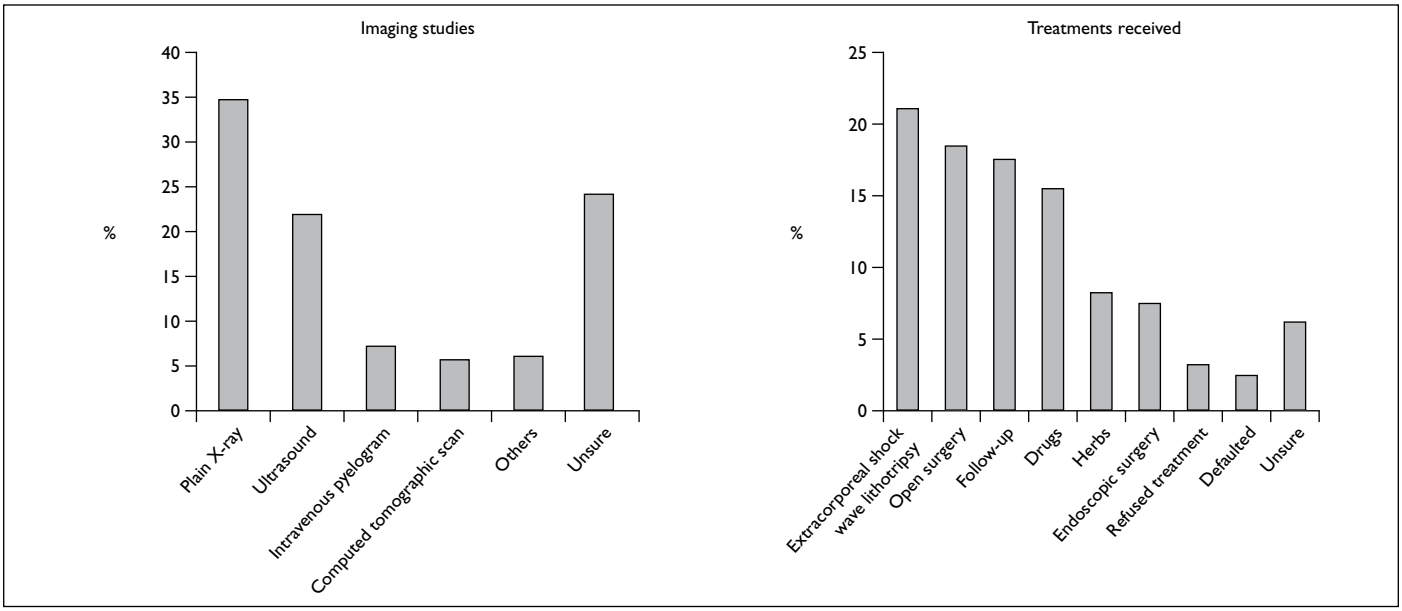

FIG 4. Imaging investigations and treatments received

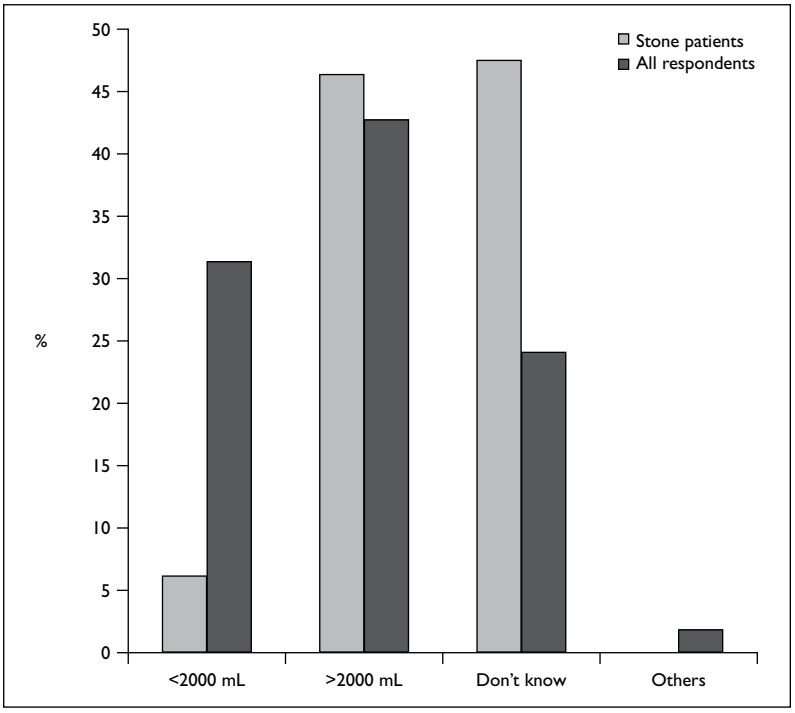

FIG 5. How much fluid should one drink to reduce urinary stone formation?

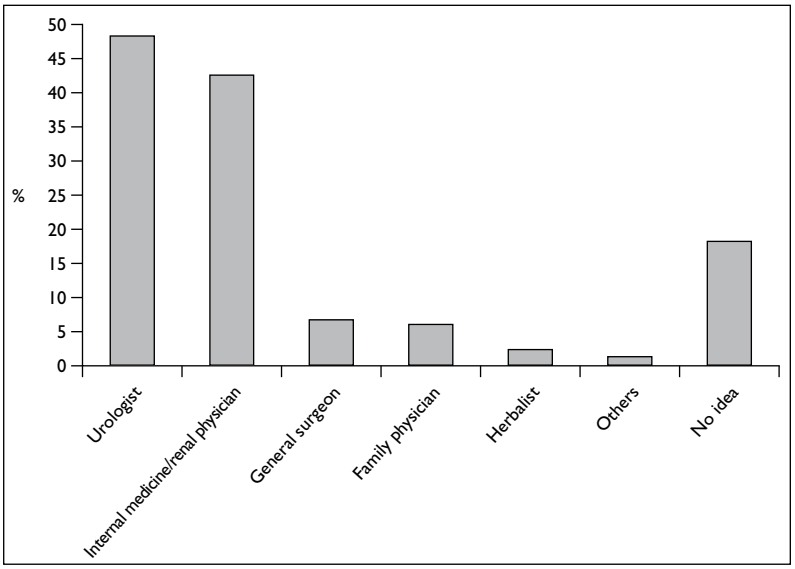

FIG 6. Answers to "In your opinion, who should be consulted for treatment if you have urinary stone disease?" (multiple answers allowed, a total of 1009 respondents with 1271 answers)

testing knowledge and awareness about the minimal amount of fluid intake to reduce the chance of urinary tract stone formation, 43% of the respondents suggested more than 2 L, 31% indicated less than 2 L, and 24% gave no answer. Interestingly, among the 25 respondents with urinary tract stones, 48% replied "not knowing" among the answer options (Fig 5). The questionnaire also asked about food items (out of a range of options) that could increase stone formation. Only 9% selected salty food (the correct answer) and less than 3% picked other relevant items (meat, nuts, and spinach), whilst 66% had no idea. When asked about whether calcium intake should be curtailed to reduce the chance of urinary stone formation, 33% answered "yes" (incorrect), 37% answered "no", and 30% had no idea.

The last question was about the specialty of doctor that the respondents thought most suitable for treating urinary stone disease; 48% chose urologists but 43% chose either an internal medicine or renal physician (Fig 6).

Discussion

Nephrolithiasis is a common problem. Most of the time the cause is unknown (idiopathic), though closely related to a number of factors including age,[10,11] gender, race,[12] dietary[6,7] and fluid intake habits,[9,12] and socio-economic factors.[5] It is well recognised that the prevalence of nephrolithiasis varies in different parts of the world[10,13-18]; stone disease is most common among older white males (approximately 10%), lowest in younger black females (approximately 1%) with Asians in between.[12] As the pathogenesis was generally believed to be related to urinary supersaturation and crystallisation of substances within urine,[19] diet and fluid intake pattern could affect the amount and concentration of various substances in urine and therefore urinary stone formation.[6,7] There is evidence to show that by increasing awareness and changing fluid and dietary intake, the chance of urinary stone formation can be reduced.[1,2,20]

The prevalence of patients with renal stone disease was 2.5% in Hong Kong according to this questionnaire survey of randomly sampled subjects, compared to 3.5% in Seoul,[17] 5.4% in Japan,[15] and 9.6% in Taiwan.[18] Similar to international data, male gender, being elderly, and manual work appeared to be associated with a higher chance of stone formation. From this study, the authors could not identify any obvious explanation for the apparently lower prevalence in Hong Kong. Unfortunately, as the stone population within the respondents was too small (25 only), no meaningful statistical correlations could be established.

About half of those interviewed replied that urologists should be the ones to treat urinary tract stones (48%), whilst only 30% of respondents with stone disease attended urologists and 32% did not know the specialty of their attending doctor.

Due to limitations of the study (a telephone-conducted questionnaire), detailed investigation of the diet of respondents was not possible; only the fluid volume intake pattern was investigated. Again statistical correlation was not undertaken due to the

small population of subjects with stone disease. From the available data however, a greater proportion of stone patients than all respondents stated that their daily fluid intake was less than 2 L (73 vs 68%; Fig 2). In addition, although patients with stone problems should have been managed and educated by health professionals after their diagnosis was known, a larger proportion of them than overall respondents had no idea about how much they should drink to reduce stone formation (48 vs 24%; Fig 5). With respect to dietary measures to prevent stone formation, a large proportion (66%) had no idea and only a small proportion were able to pick a correct answer. Similarly, roughly two thirds of the respondents gave erroneous answers (reducing calcium can prevent stone formation) or had no ideas about calcium intake and stone formation.

The authors believe that despite Hong Kong being an affluent city, both the public and stone patients had little idea about the disease and its prevention, which also reflects on the lack of adequate education by health care professionals and the government.

Conclusion

Hong Kong has a relatively low prevalence of renal stone disease compared to neighbouring areas. However, the public and the stone patients in the city have little knowledge and awareness about this important health problem. It is the responsibility of the health professionals to provide better education.

Appendix

Additional material related to this article can be found on the HKMJ website. Please go to <http://www.hkmj.org>, search for the appropriate article, and click on Full Article in PDF following the title.

Acknowledgement

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Appendix

香港大學民意研究計劃
香港腔內微創泌尿外科學會

合作進行

「腎結石」問卷調查 2007

調查問卷 (中文版)

2007 年 10 月 18 日

第一部分　自我介紹

喂，先生／小姐／太太你好，我姓___，我係香港大學民意研究計劃既訪問員黎既，我地宜家同香港腔內微創泌尿外科學會合作進行緊一個有關腎結石既調查，想訪問下市民既意見，我地只會阻你幾分鐘時間。請你放心，你既電話號碼係經由我地既電腦隨機抽樣抽中既，而你提供既資料係會絕對保密既。如果你對今次既訪問有任何疑問，你可以打 xxxxxxxx 同我地既督導員 x 小姐聯絡, 或者喺辦公時間致電 xxxx-xxxx 向香港大學非臨床研究操守委員會查詢呢次既調查。請問可唔可以呢？

可以
唔可以 ⟶訪問完成，多謝合作，拜拜。（skip to end）

[S1] 請問你既電話號碼係唔係xxxx xxxx?

係
唔係 (skip to end)

[S2]　請問你住響邊區呢?

灣仔	大埔	離島
東區	觀塘	荃灣
中西區	九龍城	葵青
南區	黃大仙	屯門
西貢	旺角	元朗
沙田	深水埗	拒答
北區	油尖	

[S3]　請問你呢伙有幾多人住呢？（入實數）

_____
拒答

第二部分　選出被訪者

[S4]　　請問你屋企而家有冇**18 歲或以上**既香港居民係度，因為我地要隨機抽樣，如果多過一位，請你叫即將生日果位黎聽電話。（訪問員可舉例說明：『即係有冇 10 月或未來三個月內生日既人係度？』）【如果戶中冇所屬年齡之對象，訪問告終；多謝合作，收線。】

有
冇　⟶ 訪問完成，多謝合作，拜拜。（skip to end）

第三部分　問卷部分

I. 一般市民意見

[Q1]　　一般黎講，請問你一日大概會飲幾多毫升既流質飲料呢？例如水、茶、咖啡、果汁、湯水等等。如果以 250 毫升既標準紙包飲品計，你平均一日大概會飲幾多包？

_____包（入實數）
唔知 / 難講
拒答

[Q2]　　你認為一個正常人每日至少要吸收幾多毫升水份至可以有助防止生腎石呢？

_____毫升（入實數）
只要及時補充失去水份便可
無論吸收多少都不影響
唔知／難講
拒答

[Q3]　　你知唔知有 D 乜野食物或飲品會增加生腎石既機會呢？【訪問員不讀答案，可選多項，追問"仲有呢？"】

魚類
牛肉

豬潤
咖啡
花生及果仁
啤酒
吸煙或食雪茄
菠菜
菜心
朱古力
其他（請註明）_____
沒有任何食物或飲品
唔知／難講
拒答

[Q4] 你認為控制鈣質既吸收，即係唔好食太多含鈣質既食物，會唔會有助防止生腎石呢？

會
唔會
唔知 / 難講
拒答

[Q5] 你認為經常忍住小便會唔會引致生腎石呢？

會
唔會
唔知 / 難講
拒答

[Q6] 就你所知，腎石患者應該去睇咩科既醫生?【訪問員不讀答案，可選多項，追問“仲有冇其他呢？”】

中醫
家庭醫生
內科醫生
腎科醫生
普通外科醫生
泌尿科醫生
其他（請註明）_____
不需要睇醫生
唔知 / 難講
拒答

II. 腎結石患者意見

[Q7] 跟住想問下你或者你既屋企人有冇曾經患過腎結石？【如被訪者覺得尷尬，訪問員請解釋這些問題是有助了解香港市民的整體健康情況，而所提供的數據只會作綜合分析之用。】

自己現時／曾經有
家人現時／曾經有
自己或家人從來都冇 (skip to DM1)
唔知／難講 (skip to DM1)
拒答 (skip to DM1)

[Q8] 【只詢問 Q7 答「自己或家人現時／曾經有」的被訪者】 為左醫治腎結石，你(或你屋企人)曾經睇過咩科既醫生?【訪問員不讀答案，可選多項，追問"仲有冇其他呢？"】

家庭醫生
普通外科醫生
內科醫生
腎科醫生
泌尿科醫生
中醫
政府醫生 (不知道哪個專科)
其他（請註明）_____
沒有看醫生
唔知／難講
拒答

[Q9] 咁你(或你屋企人)係用乜野方法診斷出有腎石? 【訪問員讀出 4 項答案，次序由電腦隨機排列，可選多項，追問"仲有冇其他呢？"】

X-光平片
超聲波掃瞄 (Ultrasound, B 超)
靜脈腎盂造影 (腎顯映, IVP)
電腦掃瞄 (CT scan)
其他（請註明）_____
唔記得／唔知／難講
拒答

[Q10] 請問你(或你屋企人)曾經接受過邊種治療?【訪問員讀出 6 項答案，次序由電腦隨機排列，可選多項，追問"仲有冇其他呢？"，如被訪者答「激光」，追問是否指「體外衝擊波/碎石治療」?】

定期覆診 (觀察治療)
傳統中醫治療 (如服用中草藥)
服用西藥
體外衝擊波治療 (體外碎石治療, ESWL)
內窺鏡手術
開刀手術
其他（請註明_____）
拒絕接受治療 (skip to Q12)
沒有再去見醫生 (skip to Q12)
唔記得／唔知／難講 (skip to Q12)
拒答 (skip to Q12)

[Q11] 【只詢問有接受治療者】咁你(或你屋企人)用既治療方法最後有冇成功除去腎石呢?

成功完全清除腎石
只清除了部份腎石
沒有清除腎石
唔知／難講
拒答

[Q12] 最後，請問你會唔會推介醫治你(或你屋企人)既醫生俾其他腎石患者呢？【訪員追問程度】

一定會
可能會
多數唔會
一定唔會
唔知／難講
拒答

第四部分　個人資料

最後，我想問你些少個人資料，方便分析。

[DM1] 性別

男
女

[DM2a]　　年齡

(準確數字)
唔肯講

[DM2b] 【只問不肯透露準確年齡被訪者】年齡 (範圍) [訪問員可讀出範圍]

18-20
21-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60 或以上
唔肯講

[DM3]　　教育程度

小學以下
中學
預科
專上非學位
專上學位
研究院或以上
拒絕回答

[DM4] 職業

經理及行政人員
專業人員
輔助專業人員
文員
服務工作及商店銷售人員
漁農業熟練工人
手工藝及有關人員
機台及機器操作員及裝配員
非技術工人
全職學生
全職家庭主婦
不能辨別
其他（包括失業、已退休、及其他非在職者）
拒答

多謝你接受訪問。如果你對呢個訪問有任何疑問，可以打熱線電話 XXXX-XXXX 同我地既督導員 X 小姐聯絡，或於辦公時間內致電 XXXX-XXXX 查詢今次訪問既真確性同埋核對我既身分。拜拜！

The University of Hong Kong
Public Opinion Programme

Hong Kong Society of Endourology

Jointly organized

Survey on Urinary Stone Disease 2007

English Questionnaire

October 18, 2007

Part I Introduction

Good evening! My name is [interviewer's name]. I am an interviewer at the Public Opinion Programme of the University of Hong Kong. We are conducting a survey on urinary stone. This survey only takes up a couple of minutes. The information you provide will be kept strictly confidential and data collected will only be used for analysis. Is it okay for you to participate in this survey?

☐ Yes
☐ No Interview ends. Thank you and bye.（skip to end）

Part II Selection of Respondents

[S1] How many members are there in your household aged 18 or above at this moment? (Interviewers can directly ask if there is only one qualified respondent at home. If so, interviewer can interview him / her at once.) Since we need to conduct random sampling, if there is more than one available, I would like to speak to the one who will have his / her birthday next. (Interviewer can illustrate with examples: "that means is there anyone who will have his / her birthday in October or the coming three months?") [If there is no household member aged 18 or above, terminate the interview.]

☐ Yes
☐ No Interview ends. Thank you and bye.（skip to end）

Part III Opinion Questions

I) Opinions of General Public*

[Q1] Generally speaking, how much fluid would you drink in each day? Fluids may include water, tea, coffee, juice, soup, etc. In terms of a standard paper package of 250mL drinking fluid, how many packages would you drink in each day?

_____ package(s)
Don't know/hard to say
Refuse to answer

[Q2] What do you think is the minimal amount of fluid to be taken in each day for reducing renal stone formation rate?

_____ ml (Input exact figure)
It's okay as long as the amount lost is replenished soon enough
No matter how much one intakes
Don't know/hard to say
Refuse to answer

[Q3] Do you know which dietary ingredients may predispose the formation of renal stones? (multiple responses allowed)

Fish
Beef
Pig liver
Coffee
Nuts and peanuts
Beer
Smoking
Spinach
Choi-sum
Chocolate
Others（Please specify：_____）
None
Don't know/hard to say
Refuse to answer

[Q4] Do you think restricting calcium intake, meaning not eating too much food with calcium in it, is good for prevention of urinary stone disease?

Yes
No
Don't know/hard to say
Refuse to answer

[Q5] Do you think holding urine in bladder will cause renal stone disease?

Yes
No
Don’t know/hard to say
Refuse to answer

[Q6] In your opinion, who should be consulted for treatment if a person has renal stone disease? (multiple responses allowed)

Traditional Chinese Medical Practitioner
General practitioner
Internalist
Renal physician
General surgeon
Urologist
Others (Please specify：_____)
No need to see a doctor
Don’t know/hard to say
Refuse to answer

II) Opinions of Urinary Stone Patients

[Q7] Do you or your direct family member have renal stone disease now or before?

Yes, I have or had before
Yes, my family member has or had before
Not at all (skip to DM1)
Don’t know/hard to say (skip to DM1)
Refuse to answer (skip to DM1)

[Q8] Which type of doctor have you (or your family member) consulted for the disease? (multiple responses allowed)

General practitioner
General surgeon
Internalist
Renal physician
Urologist
Traditional Chinese Medical Practitioner
Government doctor (don’t know which type)
Didn’t see any doctor
Don't know / hard to say
Refuse to answer

[Q9] What investigation was done to diagnose the stone? (Interviewers to read out first 4 answers randomly ordered by computer, multiple answers allowed)

Plain X-ray
Ultrasound
Intravenous pyelogram (IVP)
CT scan
Others (Please specify：_____)
Forgotten/Don’t know/hard to say
Refuse to answer

[Q10] What treatment did you (your family member) receive for the stone? (Interviewers to read out 6 answers, order to be randomised by computer, multiple responses allowed)

Frequent check-up
Chinese Herb
Drugs
Extracorporeal Shock Wave Lithotripsy (ESWL)
Operation with endoscopes
Open surgery
Others (Please specify：_____)
Not willing to receive treatment (skip to Q12)
Didn’t see a doctor afterwards (skip to Q12)
Forgotten/Don’t know/hard to say (skip to Q12)
Refuse to answer (skip to Q12)

[Q11] [Only for those who had treatment] Did the treatment clear the stone of yours (your family member)?

Cleared the whole stone
Cleared part of the stone
Not cleared at all
Don’t know/hard to say
Refuse to answer

[Q12] Will you (your family member) recommend your (your family member’s) doctor to friends who have the same illness?

Certainly will
May be
Most unlikely
Certainly not
Don’t know/hard to say
Refuse to answer

* Answers to Q2: 2000 mL, Q3: beef, pig liver, spinach, coffee, nuts and peanuts, chocolate, Q4: no, Q5: no

Part IV Demographics

Lastly, I would like to ask you for some personal information for further analysis.

[DM1] Gender

Male
Female

[DM2a] Age

_____
Refuse to answer

[DM2b] [Only for respondents who are unwilling to disclose their exact age] Age (range)

18-20
21-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
Over 60
Refuse to answer

[DM3] Education attainment

Primary or below
Secondary
Matriculated
Tertiary, non-degree course
Tertiary, degree course
Postgraduate or above
Refused to answer

[DM4] Occupation

Managers and administrators
Professionals
Associate professionals
Clerks
Service workers and shop sales workers
Skilled agricultural and fishery workers
Craft and related workers

Plant and machine operators and assemblers
Non-skilled workers
Students
Housewives
Unclassified
Others (unemployed, retired, etc.)
Refused to answer

Thank you for your time. If you have any questions regarding this interview, you can contact our supervisor at XXXX XXXX or call XXXX XXXX during office hours to verify this interview's authenticity and confirm my identity. Bye bye.

***** **End of interview** *****