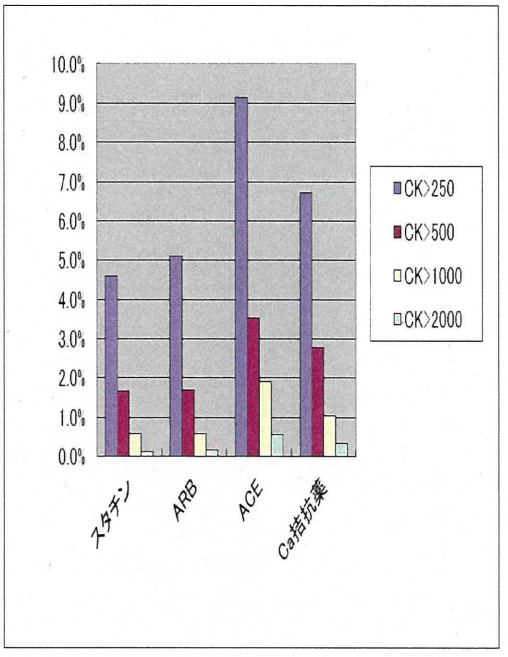


図４

抽出 4.0（薬剤投与後の CPK 上昇）の結果

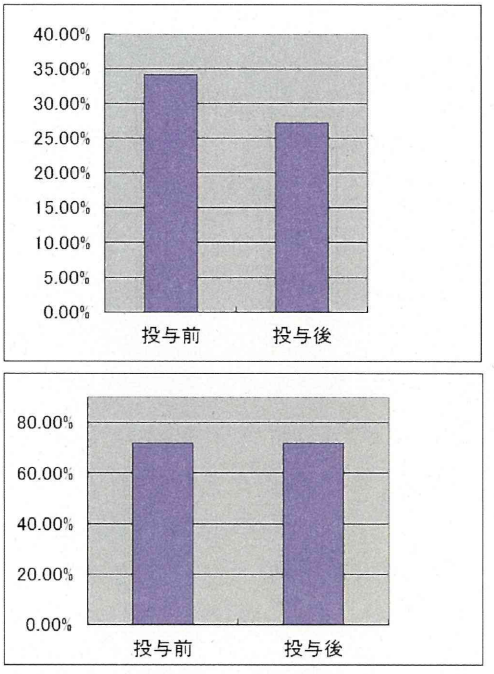


図６

抽出 6.0（上：高尿酸血症に対する薬剤の効果）

7.0（下：高尿酸血症と腎機能）の結果

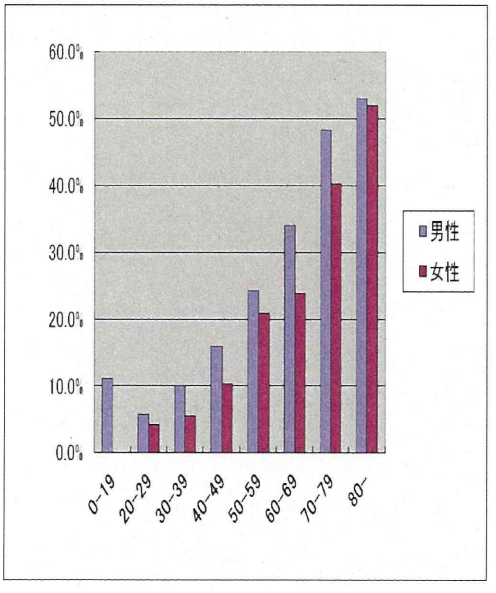


図５

抽出 5.0（慢性腎臓病（CKD）の年齢分布）の結果

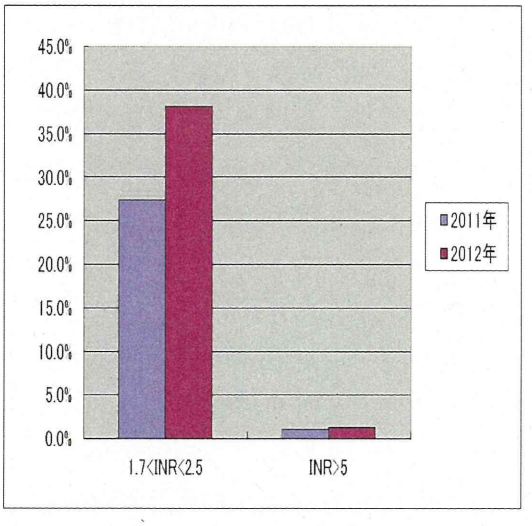


図７

抽出 8.0（ワーファリン服用患者における出血傾向モニタリング）の結果

これらの抽出結果から、件数などについては、全例で妥当な数値であった。また、結果の傾向も大部分は妥当と思われた。しかしながら、薬効が認められない結果になっているものもあり（図2）、これらは、活用データが、10ヶ月間であり、SS-MIX 標準化ストレージ上では薬剤の初回投与に見えるものの多くが既に投与中のものであることが考えられた。その対策には蓄積年数の増加が考えられるため、平成24年3月末までに処方データ、検査結果データを平成19年1月に遡り、HOTコード、JLAC10 コードを古いコードまでマッピングした上で入力を行なった。これにより、蓄積データの不足は解消された。

また、今回の方法では DPC 情報が使えなかったが、DPC 情報やパス情報などは HIS から、高速解析エンジン（統合プラットフォーム（Ensemble）を介して高速抽出システム（DeepSee）への出力を行なっており、DPC 情報を含む検索は、DeepSee で検索することが考えられた。平成24年度からはD☆D と DeepSee の両者を活用して検証を行う予定である。

## D.考察

本年度、分担研究の場である九州大学病院では、本研究課題である「情報システムのデータを利用した臨床指標に関する研究」を施行するための基礎検証を行なった。

すなわち、代表研究機関である浜松医大病院が考案し、施行し得た抽出条件で、他医療機関である九州大学病院の病院情報システムで、どの程度、比較出来るデータ出力ができるか？　そのコスト（時間）はどの程度か？　抽出した結果は妥当か？　などの視点により課題を抽出し、対策を行うことを目的としたわけである。対策を含めてこれらの目的をほぼ達成できたと考えられる。

平成24年度からは、5年間分以上の蓄積データを活用しながら、実診療に役立つ、あるいは医療安全に寄与する臨床指標の抽出を実際に行う予定である。

## E.結論

以上、本年度研究の検証を通して、抽出システムの基礎検証を達成した。

## F.健康危険情報

平成23年度の本研究においては、生命、健康に重大な影響を及ぼすと考えられる新たな問題、情報は取り扱わなかった。

## G.研究発表

### 1.論文発表

な し

### 2.学会発表

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## H.知的財産権の出願・登録状況（予定を含む）

1. 特許取得　　なし
2. 実用新案登録　なし
3. その他　　なし

# Ⅲ.研究成果の刊行に関する一覧表

# 研究成果の刊行に関する一覧表

## 雑　誌

| 発表者氏名 | 論文タイトル名 | 発表誌名 | 巻号 | ページ | 出版年 |
|---|---|---|---|---|---|
| M.Kimura, P.Croll, B.Li, C.P.Wong, S.Gogia Y.Faud,Y.S.Kwak, S.Chu A. Marcelo, Y-H. Chow, Y-C.(J) L | Survey on Medical Records and EHR in Asia-Pacific Region | Methods of Information in Medicine | 50(4) | 386-391 | 2011 |
| 木村通男 | 医療情報の過去・現在・未来, -Data, Information, Intelligence,- 第2回現在編 | 医療情報学, 第31回医療情報学連合大会論文集 | 31-Suppl | 4-7 | 2011 |
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# Ⅳ.研究成果の刊行物・別刷

## 【論文発表】

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# Survey on Medical Records and EHR in Asia-Pacific Region

## Languages, Purposes, IDs and Regulations

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[12]Taipei Medical University, Taipeh, Taiwan

**Keywords**
Health care surveys, medical records, electronic health records, languages, privacy

**Summary**

**Objectives:** To clarify health record background information in the Asia-Pacific region, for planning and evaluation of medical information systems.

**Methods:** The survey was carried out in the summer of 2009. Of the 14 APAMI (Asia-Pacific Association for Medical Informatics) delegates 12 responded which were Australia, China, Hong Kong, India, Indonesia, Japan, Korea, New Zealand, the Philippines, Singapore, Thailand, and Taiwan.

**Results:** English is used for records and education in Australia, Hong Kong, India, New Zealand, the Philippines, Singapore and Taiwan. Most of the countries/regions are British Commonwealth. Nine out of 12 delegates responded that the second purpose of medical records was for the billing of medical services. Seven out of nine responders to this question answered that the second purpose of EHR (Electronic Health Records) was healthcare cost cutting. In Singapore, a versatile resident ID is used which can be applied to a variety of uses. Seven other regions have resident IDs which are used for a varying range of purposes. Regarding healthcare ID, resident ID is simply used as healthcare ID in Hong Kong, Singapore and Thailand. In most cases, disclosure of medical data with patient's name identified is allowed only for the purpose of disease control within a legal framework and for disclosure to the patient and referred doctors. Secondary use of medical information with the patient's identification anonymized is usually allowed in particular cases for specific purposes.

**Conclusion:** This survey on the health record background information has yielded the above mentioned results. This information contributes to the planning and evaluation of medical information systems in the Asia-Pacific region.

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Methods Inf Med 2011; 50: 386–391
doi: 10.3414/ME11-02-0002
received: January 12, 2011
accepted: April 3, 2011
prepublished: July 26, 2011

## 1. Introduction

In the Asia-Pacific region, the use of Electronic Health Record (EHR) systems has been increasingly expanded among healthcare institutions, and many regional/national EHR projects have already been reported [1–4]. Also, systematic review is done on the quality requirements of EHR [5], of which only few of deployment in Asia-Pacific region is included. On the other hand, there is such a diversity of background in the countries and regions of the Asia-Pacific area that it would be a mistake to make sweeping generalizations.

First, the gap between medical demands and supply varies among developing and developed countries. Therefore, the purposes of EHR and data sharing will also vary among providers and will naturally reflect their demand- supply gap. At a fundamental level, therefore, the purposes of the medical record itself – regardless the medium (paper or electronic) – will be different.

Next, the language used for medical records, education and practices vary among regions. Language difference directly reflects IT system difference, not only for its display and command language, but also for coding schema of medical terms and concepts. The existence or absence of patient ID numbers, their range of application when used, and regulations governing private data and secondary use

**Table 1** Languages used for each situation. "Must be Japanese" in regulations on descriptions means there is some regulations what language to be used for medical records. Blank in this means there is no regulation on this.

| | Medical records | Regulations on description | Nursing records | Medical school education | Nursing school education |
|---|---|---|---|---|---|
| Australia | English | Must be English | English | Emglish | English |
| China | Chinese | | Chinese | Chinese | Chinese |
| HK | English | | English | English | English |
| India | English | | English | English | English |
| Indonesia | Indonesia | Must be Indonesia | Indonesia | Indonesia | Indonesia |
| Japan | Japanese | Must be Japanese | Japanese | Japanese | Japanese |
| Korea | Korean & English | Must be Korean | Korean & English | Korean & English | Korean & English |
| NZ | English | | English | English | English |
| Philippines | English | | English | English | English |
| Singapore | English | | English | English | English |
| Thailand | Thai & English | | Thai & English | Thai & English | Thai & English |
| Taiwan | English | | Chinese | Chinese | Chinese |

**Table 2** 2nd, 3rd, 4th purposes of medical records

| | 2nd | 3rd | 4th | 5th | 6th | 7th |
|---|---|---|---|---|---|---|
| Australia | Billing | Research | Management | Education | Public Health | |
| China | Management | Billing | Research | Public | Health Education | |
| HK | Management | Public Health | Billing | Research | Education | |
| India | Billing | "Protection against Litigation" | Management | Public Health | Education | |
| Indonesia Billing | Public Health | Management | Education | Research | | |
| Japan | Billing | Education | Research | Management | Public Health | |
| Korea | Billing | Education | Research | Management | Public Health | "Legal Document" |
| NZ | Management | Billing | "Health Policy" | Public Health | Education | Research |
| Public Health | Billing | Research | Public Health | Management | Education | |
| Singapore Billing | Public | Health | Management | Research | Education | |
| Thailand | Billing | Management | Education | Research | Public Health | |
| Taiwan | Billing Management | Research | Education | Public Health | | |

of medical information are also different because of the users' diverse political systems.

A consideration of such background information is critical when planning, executing or developing EHR projects as well as when attempting to learn from and evaluate other EHR projects.

Because of these reasons, it is important to know current situations, purposes, regulations concerning medical records and EHR at each country and region, for the benefit of implementers and designers of IT systems, as well as policy makers of healthcare. There was no complied report on these issues before.

In November, 2009, the APAMI (Asia-Pacific Association for Medical Informatics) Conference 2009 was held in Hiroshima, Japan. A survey was conducted prior to the conference in order to clarify the above stated background information of each nation or region. We will now report the results of that survey.

## 2. Methods

The survey was carried out in the summer of 2009. Of the 14 APAMI delegates 12 responded which were Australia, China, Hong Kong, India, Indonesia, Japan, Korea, New Zealand, the Philippines, Singapore, Thailand, and Taiwan.

Questionnaire was sent and answered by APAMI member societies, as they are the appropriate person who know their situations.

The questionnaire was as follows;

- Purpose of medical records is primarily for healthcare itself, what are 2nd? 3rd?
- Does your country/region have a National ID, a National Health ID?
- What is the status of your country/-region's EHR (lifelong health record) project status?
- Purpose of EHR is primarily for continuity of care, what are 2nd? 3rd?
- What language is used for medical records, nursing records?
- Disclosure of medical record contents to patient, referred physician, insurance payer, public health dept., health policy dept. are unconditional/conditional/prohibited?
- Secondary use of medical record (dis-identified) by public health dept., health policy dept., non-profit research, for-profit research, are unconditional/conditional/prohibited? Any general regulations exist in your country/region?

At the APAMI Conference held on November 2009, the result of the survey was released in the keynote speech by the President of the conference. During the discussion at the conference, the importance of the linkage between the National Health IDs and other social IDs was suggested and a further survey was proposed to cover privacy regulations with a clear definition of "dis-identified." In response to this, a follow up questionnaire including the following questions was sent out and answered by all 12 respondents in February 2010.

- Does your country/region have unique ID for residents?

If YES, the ID is used/linkable for/to following purposes? (Healthcare claim person number, Healthcare record patient number at each provider, Healthcare record patient number among providers (unique EHR patient number), Pension record number, Taxpayer's number, Driver's license number, Passport number, Employee number)

- Does your country/region have unique healthcare ID for patients?

If YES, the ID is used/linkable for/to following purposes? (same purposes as above)

- Is there any regulation/legislation concerning secondary use of private data? (Person's ID sufficiently anonymous, and without person's consent)

**Table 3** EHR project status. "Partially tested" can mean either "only in particular domain like prescriptions, etc. or only in partial region.

| | |
|---|---|
| Australia | Being partially tested |
| China | Being partially tested |
| Hong Kong | Almost accomplished |
| India | No plan |
| Indonesia | Being partially tested |
| Japan | Being partially tested |
| Korea | Being partially tested |
| NZ | Being partially tested |
| Philippines | No plan |
| Singapore | Being partially tested |
| Thailand | Being partially tested |
| Taiwan | Being partially tested |

**Table 4** 2nd, 3rd, 4th purposes of electronic health records

| | 2nd | 3rd | 4th |
|---|---|---|---|
| Australia | Healthcare Cost Cut | Clinical Research | Public Health/Disease Control |
| China | Public Health/Disease Control | Healthcare Cost Cut | Clinical Research |
| HK | Healthcare Cost Cut | Public Health/Disease Control | |
| Indonesia | Healthcare Cost Cut | Public Health/Disease Control | Clinical Research |
| Japan | Healthcare Cost Cut | Clinical Research | Public Health/Disease Control |
| Korea | Healthcare Cost Cut | Public Health/Disease Control | Clinical Research |
| Singapore | Healthcare Cost Cut | Public Health/Disease Control | Clinical Research |
| Thailand | Public Health/Disease Control | Clinical Research | Healthcare Cost Cut |
| Taiwan | Healthcare Cost Cut | Clinical Research | Public Health/Disease Control |

# 3. Results

## 3.1 Languages Used

The questions were "What language is used for medical records, nursing records, medical school education and nursing school education? And are there any regulations on the description of medical records?". The results are shown in ▶Table 1.

## 3.2 Purposes of Medical Records

The question was "Purpose of medical records is primary for healthcare itself, what comes after it?" The responders are asked to choose the second, third and fourth purposes from the following options; billing, clinical research, public health, medical education and hospital management. If there were any other important purposes, they were requested to specify them. The results are shown in ▶Table 2.

## 3.3 Status and Purposes of Electronic Medical Records (EHR)

The question was "What is the status of your country/region's EHR (lifelong health record) project status?" with the option to choose from 'accomplished', 'almost accomplished', 'partially tested' and 'no plan'. Then the question continues "Purpose of

EHR is primary for continuity of care, what comes after it?" with the definition of "EHR" as the patient healthcare records shared by multi-institutions to use. The responders are asked to choose the second, third and fourth purposes of EHR from the following options; public health/disease control, healthcare cost cut and clinical research. The results are provided in ▶Tables 3 and 4.

### 3.4 Resident ID, Healthcare ID

The question was about the presence or absence of unique resident ID and healthcare ID. If there was a resident ID/healthcare ID, then the question went on to ask whether the ID was used as or was linkable to other social IDs. The results are shown in ▶Tables 5 and 6.

### 3.5 Disclosure

The question was "Disclosure of medical record contents to 1) patient, 2) referred physician, 3) insurance payer, 4) public health dept., and 5) health policy dept. are unconditional/conditional / prohibited?". The results are shown in ▶Table 7.

### 3.6 Secondary Use

The question was "Secondary use of medical record (Person's ID made sufficiently anonymous, and without the person's consent) by 1) public health dept., 2) health policy dept., 3) non-profit research organizations, and 4) for-profit research organizations, are unconditional/conditional/prohibited?" And then the question went on to ask whether there are any general regulations on such secondary use? The results are shown in ▶Table 8.

## 4. Discussions

As these questionnaires were answered by persons representing APAMI member societies, current local situations are fully reflected. This survey report is the first, which lines up all answers at a time.

**Table 5** Resident ID, and its use and linkage. U means resident ID is used directly for the purpose. L means it is linkable at each authority but not directly used. N means it is not used or linkable for the purpose.

| | AU | CN | HK | IN | ID | JP | KR | NZ | PH | SG | TH | TW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| YES or NO | N | Y | Y | N | Y | Y | Y | N | | Y | Y | Y |
| Healthcare Claim Number | - | N | U | - | N | N | L | - | | U | U | U |
| Hospital Patient Number | - | N | L | - | L | N | L | - | | U | L | L |
| Unique EHR Number | - | N | U | - | N | N | L | - | | U | N | N |
| Pension Record Number | - | L | U | - | N | N | L | - | | U | N | U |
| Taxpayer's Number | - | U | L | - | N | N | L | - | | U | L | U |
| Driver's License Number | - | L | U | - | L | N | L | - | | U | L | U |
| Passport Number | - | N | L | - | L | L | L | - | | U | L | L |
| Employee Number | - | L | L | - | N | N | L | - | | U | N | L |

**Table 6** Healthcare ID, and its use and linkage. ID in the top field means citizen ID is used for healthcare purpose of some kind. U means resident ID is used directly for the purpose. L means it is linkable at each authority but not directly used. N means it is not used or linkable for the purpose.

| | AU | CN | HK | IN | ID | JP | KR | NZ | PH | SG | TH | TW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| YES, NO or Citizen ID | N | N | ID | Y | N | Y | N | Y | | ID | ID | Y |
| Healthcare Claim Number | - | - | U | N | - | U | - | U | | N | U | U |
| Hospital Patient Number | - | - | L | L | - | L | - | N | | N | L | L |
| Unique EHR Number | - | - | U | N | - | N | - | N | | N | N | N |
| Pension Record Number | - | - | U | N | - | N | - | N | | N | N | U |
| Taxpayer's Number | - | - | L | N | - | N | - | N | | N | L | U |
| Driver's License Number | - | - | U | N | - | N | - | N | | N | L | U |
| Passport Number | - | - | L | N | - | N | - | N | | N | L | L |
| Employee Number | - | - | L | L | - | L | - | N | | L | N | L |

### 4.1 Languages Used (Table 1)

Garrett reported language barriers in clinical practice [6]. To overcome this barrier, there have been many trials to standardize and code the medical languages [7].

In current practice, English is used for records and education in Australia, Hong Kong, India, New Zealand, the Philippines, Singapore and Taiwan. Most of the countries/regions are British Commonwealth members. Because of the institutionalized collaboration in credit sharing among universities in the commonwealth members, English is used for education in those countries. English is also used in the Philippines mainly because of the influence of the U.S. In Taiwan, English is used for medical records, but Chinese is used for nursing records and education.

Australia, Indonesia, Japan and Korea, use their own languages in medical records. In Japan, the reason this is done is to assure transparency of medical practices from patients' point of view.

### 4.2 Purposes of Medical Records (Table 2)

Textbook of medical record keeping says that secondary use for research is also important, though, of course, the primary purpose of medical record is information

sharing between practitioners [8]. Nine out of 12 delegates responded that the second purpose of medical records was for the billing of medical services. For the remaining three delegates the second purpose was hospital management. Research, education and public health received lower priorities. Given that conventional medical records were paper based, it would be difficult to put such data to practical use for the purposes of research or public health.

## 4.3 Status and Purposes of Electronic Medical Records (EHR) (Tables 3 and 4)

Most answers were "being partially tested"[2–4, 9, 10] with Hong Kong alone answering "almost accomplished" [1]. It is worth noting that Hong Kong has an EHR initiative to create a territory-wide information network system for sharing basic information on patients, test results and prescriptions.

Seven out of nine responders to this question answered that the second purpose of EHR was healthcare cost cutting. In Korea, centralization of information relating to medical insurance claims has provided effective prevention of unnecessary medical practices. On the other hand, questions have arisen about whether the sharing and integration of healthcare information could lead to healthcare cost savings.

As a minor purpose of EHR, higher expectation is placed over public health than over clinical research. This appears to be a characteristic of densely populated countries/regions with recent infection breakouts.

**Table 7** Disclosure (patient name identified, without patient's consent)

| | The patient | Referred Dr | Insurance | Public Health | Health Policy |
|---|---|---|---|---|---|
| AU | C(Summery) | X | X | C(Infections) | C(Claim query) |
| CN | O | O | O | C(If Name required) | X |
| HK | O | O | O | X | O |
| ID | O | O | X | C(Notifiable Disease) | O |
| IN | O | O | O | O | O |
| JP | C(Approval) | O | C(Claim query) | C(Notifiable Disease) | X |
| KR | O | X | O | O | X |
| NZ | C(Approval) | X | C(Claim data) | C(Disease Control ) | X |
| PH | O | O | O | C(per protocol) | C(per protocol) |
| SG | O | X | X | C(Infection Act) | C(Stats. Act) |
| TH | X | O | X | O | O |
| TW | X | X | X | X | X |

**Table 8** Secondary use (patient name sufficiently anonymous, without patient's consent)

| | The patient | Referred Dr | Insurance | Public Health | Health Policy |
|---|---|---|---|---|---|
| AU | C(Summary) | X | X | C(Infections) | C(Claim query) |
| CN | O | O | O | C(If Name required) | X |
| HK | O | O | O | X | O |
| ID | O | O | X | C(Notifiable Disease) | O |
| IN | O | O | O | O | O |
| JP | C(Approval) | O | C(Claim query) | C(Notifiable Disease) | X |
| KR | O | X | O | O | X |
| NZ | C(Approval) | X | C(Claim data) | C(Disease Control ) | X |
| PH | O | O | O | C(per protocol) | C(per protocol) |
| SG | O | X | X | C(Infection Act) | C(Stats. Act) |
| TH | X | O | X | O | O |
| TW | X | X | X | X | X |

## 4.4 Resident ID, Healthcare ID (Tables 5 and 6)

In Singapore, a versatile resident ID is used which can be applied to a variety of uses. Seven other regions have resident IDs which are used for a varying range of purposes. In Hong Kong and Taiwan, resident IDs are used for a relatively wide range of purposes, whereas in China, Indonesia and Japan IDs have a limited application that is primarily restricted to administration purposes (e.g. taxpayer ID number and drivers' license number) and does not include medical and welfare purposes.

Regarding healthcare ID, resident ID is simply used as healthcare ID in Hong Kong, Singapore and Thailand. When a unique healthcare ID is used that is different from the resident ID, the primary purpose is for insurance claims (Japan, New Zealand and Taiwan). In Singapore where regulations are strictly enforced, resident ID can be simply used as a patient number at any healthcare institution. Most nations/regions, however, employ dual ID systems where a separate patient number, linkable to resident ID, needs to be assigned at each healthcare institution. As in any clinical research, the use of a dual ID system is to prevent large-scale leakages of data involving patients' private information.

## 4.5 Disclosure (Table 7)

Data disclosure to the patient occurs in 10 out of 12 nations/regions. In Japan, appro-

val is needed in cases where a physician judges that disclosure to the patient might harm the patient's mental and/or physical well-being.

Contrary to our expectations, information disclosure to referred doctors is not accepted in five countries/regions. Most of these cases require the patient's consent, suggesting a patient's autonomous rights are respected in these areas.

Disclosure to insurance organizations and companies are accepted in the majority of the nations/regions, including Japan and New Zealand where the disclosure is restricted to insurance claim data, and does not extend to all medical data.

Disclosure for the purpose of public health/disease control is allowed under the particular regulations of specified diseases, such as contagious diseases, in most nations/regions, with fewer countries/regions allowing disclosure for the purpose of healthcare policy making. This trend appears to reflect on public attitudes toward emerging infectious diseases and preparedness in the Asia-Pacific region.

### 4.6 Secondary Use (Table 8)

Needless to say, data in healthcare information systems are highly valued for many purposes including researches, especially for translational research to tie laboratory to practice [11].

As regards to the secondary use of medical data by the centralizing of medical records, the majority of countries/regions allow such centralization for the purpose of public health and health policy making. There are, however, some restrictions that limit application to, for example, statistical purposes or for protection against infectious diseases.

Ten countries/regions allow secondary usage of data for non-profit research when it is approved by the IRB (Institutional Review Board), but only seven countries/regions permit the secondary usage of data for profit-oriented research.

Only four countries/regions have legislation concerning private medical information, which is more specialized than general privacy regulations. Note that you should take into account that there are countries/regions with quite strict general regulations such as Singapore in contrast to others with less strict regulations.

## 5. Conclusion

Concerning languages used for medical records and education, English is widely used mainly in British Commonwealth members, while other countries use their own languages. In Indonesia, Japan and Korea, use of the native language is encouraged.

The most common reason given for the purpose of medical records (which comes after healthcare itself) is for the billing of medical services and the most common answer about the purpose of EHR (which comes after continuity of care) is for healthcare cost savings. Next, disease control was given higher priority than clinical research, suggesting the Asia-Pacific region is at a particularly high risk of infectious diseases.

Eight countries/regions adopt resident ID but with varying degrees of application. In Singapore, resident ID can be used for various purposes including patient ID, but as a general rule patient ID is different from resident ID. In Taiwan and Hong Kong, resident ID is relatively versatile. When unique healthcare ID is different from resident ID, the primary purpose is for billing indicating that separate ID has yet to become a centerpiece of the EHR project.

In most cases, disclosure of medical data with patient's name identified is allowed only for the purpose of disease control within a legal framework and for disclosure to the patient and referred doctors.

Secondary use of medical information with the patient's name removed is usually allowed in particular cases for specific purposes. When it is for research purposes, secondary use of medical information is permitted only with IRB approval.

In summary, this first survey on the subject of EHR background information has yielded the above mentioned results. This information contributes to the planning and evaluation of medical information systems in the Asia-Pacific region.

### Acknowledgment

Professor Yun Sik Kwak (Korea), the co-author and survey responder, passed away before the publication of this paper. The first author wishes to express his sincerest appreciation to Dr. Yun for his contribution to this survey and to medical informatics. May his soul rest in peace.

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# Ⅳ.研究成果の刊行物・別刷

## 【学会発表】

1. 木村通男:
医療情報の過去・現在・未来,
-Data, Information, Intelligence,-
第 2 回現在編,
第 31 回医療情報学連合大会,
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第 31 回医療情報学連合大会論文集
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# 医療情報の過去・現在・未来 −Data, Information, Intelligence 第2回現在編

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浜松医科大学医療情報部

# Data, Information, Intelligence – Past, Present and Future of Medical Informatics, Part 2: Present Situations

Kimura Michio
Hamamatsu University School of Medicine

Among OECD countries, healthcare expense of Japan, numbers of doctors per population are the lowest, number of nurses are in the middle, clinical encounters and CT scanners are the highest. Research institute of JMA reported that these factors positively correlate to average life span. Comparison of itemized breakdown of healthcare expense between 1998 and 2008 shows remarkable decrease of medicine, in contrast with increase of operation/intervention. Chemical laboratory examination and image examination showed no change.

This status shows that Japan should be proud that anyone can have free access to high level healthcare, with reimbursement transaction carried not by themselves, but by healthcare providers. This high chance of clinical encounters, examinations leads to highest indicators such as life expectancy, less infectious disease. Nevertheless, the problem is that Japanese citizens are not aware of these facts.

A survey to citizens showed that 75% answered positive to compile their health record in one electronic medical records. Interviews to dispatch team to disaster area clarified that past prescription history is the highest priority among needed healthcare information about refugees. These facts shows that, solving the privacy issues, people already require healthcare information to be more accessible in electronic ways.

Keywords:

## 1. はじめに

昨年は学会長講演、第1部過去編として、30回を迎えた医療情報学会の歩みを、論文数、カテゴリーの変遷、また80年代からの写真を交えながら、医療情報システムの来し方を振り返った。そこでは故開原成允先生が1994年に記された、「医療情報学今後5年の課題」を引用し、その現在における評価を試みた。

今回は、第2部現在編として、まず現在の医療に関する指標を参照し、ついで医療情報がいま求められるものについて論じ、10年前に筆者が示した「10年後の医療情報の予測」の評価を試みる。

## 2. 医療関連データと国際比較

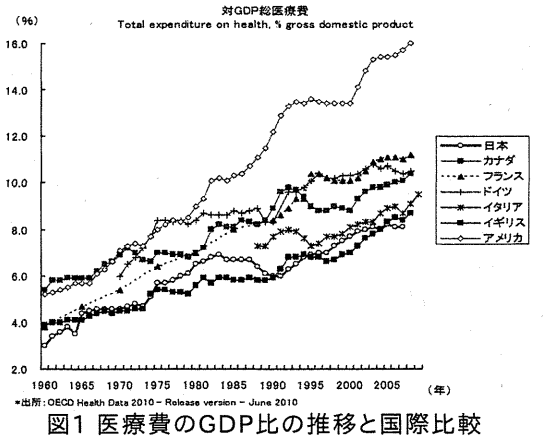


図1 医療費のGDP比の推移と国際比較

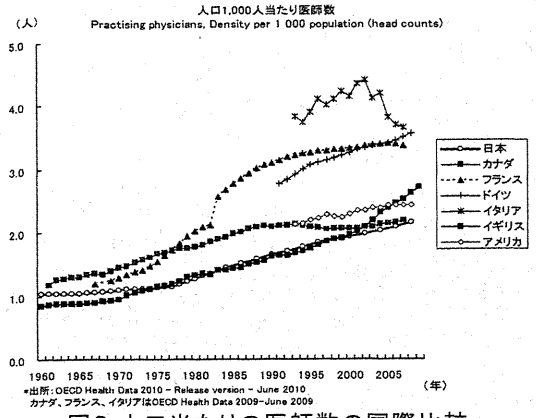


図2 人口当たりの医師数の国際比較

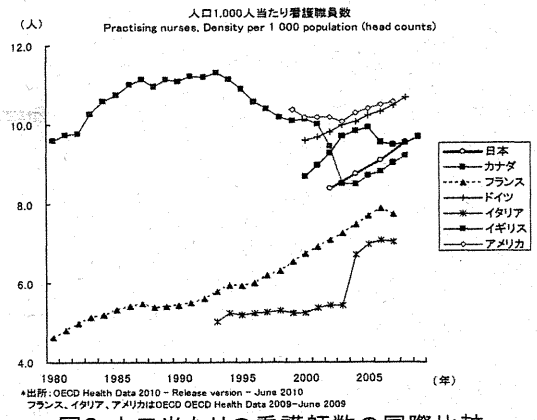


図3 人口当たりの看護師数の国際比較

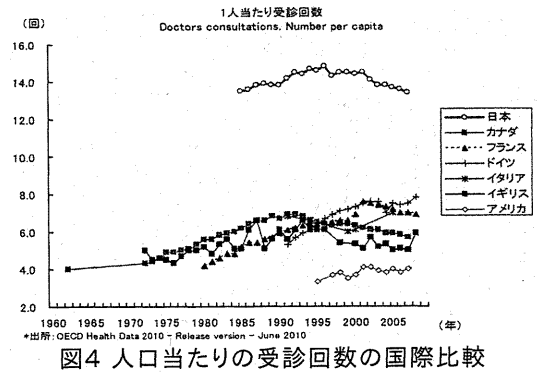


図4 人口当たりの受診回数の国際比較

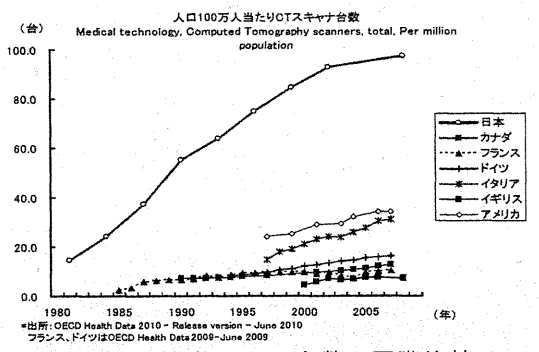


図5 人口当たりのCT台数の国際比較

この分野でよく引用されるのが、OECDの統計である[1)]。日本の医療費はGDP比8&程度であり、無理に医療費を抑えて長期入院待ちなどの弊害が出た英国の8%を最低に、だいたい9-10%程度であるが、アメリカが16%と突出して高い。

人口当たりの医師数も日本は最下位であるが、看護師数は中間に位置する。また受診回数、CT台数は突出して高い。

| | 平均寿命 | |
|---|---|---|
| | | 除日本 |
| 対GDP総医療費 | 0.403 | 0.440 |
| 1人当たり総医療費 | 0.533 | 0.563 |
| 総医療費に占める公的医療費の割合 | 0.331 | 0.303 |
| 総医療費に占める医薬品費および非耐久性医療財の割合 | -0.622 | -0.674 |
| 人口1,000人当たり医師数 | 0.382 | 0.465 |
| 人口1,000人当たり看護職員数 | 0.497 | 0.509 |
| 人口1,000人当たり急性期病床数 | 0.109 | -0.061 |
| 人口1,000人当たり精神病床数 | 0.393 | 0.301 |
| 人口100万人当たりMRI台数 | 0.493 | 0.441 |
| 人口100万人当たりCTスキャナ台数 | 0.510 | 0.506 |
| 1人当たり受診回数 | -0.165 | -0.316 |
| はしか予防接種率 | -0.393 | -0.422 |
| 3種混合ワクチン接種率 | -0.144 | -0.135 |
| 高齢者のインフルエンザ接種率 | 0.368 | 0.412 |
| 平均在院日数 | 0.342 | 0.270 |

図6 平均寿命との各要素の相関

このデータを元に、日医総研が興味深い分析を行っている[2)]。そこでは、人口当たり医師数、看護師数、CT台数すべて、平均寿命に強い正の相関を示していることが明らかになっている。医師数、看護師数については、平均寿命が長い日本が足を引っ張っているにもかかわらずである。一方、日本が飛びぬけて高いCT台数について、日本が引っ張っているという批判に対しては、あえて日本を外した国々でも同じように強い正の相関を示していることで、反駁できる。医師数、看護師数の寄与は当然としても、CT台数に関しては、よく「突出した台数は無駄であり、厳密な適用と効率的な運用で医療費削減を」との批判を耳にするが、欧米の4倍ほどの普及率の一方で、CT検査のフィーは数分の一である、という点を見落とした批判である。皮肉な言い方をすれば、ここまでCT検査を安価に提供することを可能としたからこそ、多くの頭痛に対してCT検査が行なわれ、重篤な、そして発症後の治療に社会的なコストが長期間かかる、脳血管障害を未然に防ぐこ

とが可能となっている、ということであろう。ただしこの「安価に提供」の達成は、機器の量産やメンテの効率化によるコストダウンだけではなく、検査手技、読影行為などが低く抑えられた結果であることを、忘れてはならない。

## 3. 医療行為別の比率(平成10年度と平成20年度の比較)

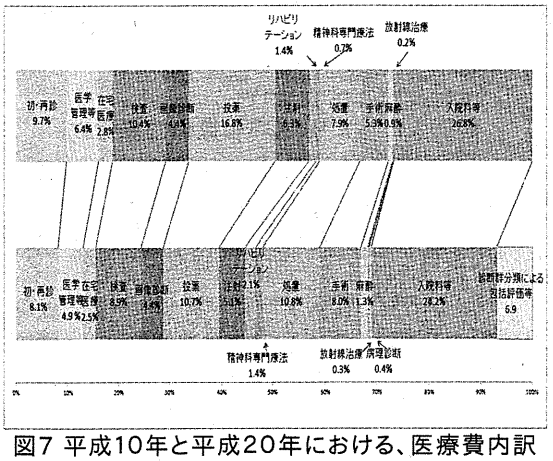


図7 平成10年と平成20年における、医療費内訳

図7は、医療行為別の比率を、平成10年と平成20年で比較したものである。うかがえる所見は、まずDPC分の登場である。この部分は、当然手術費以外に按分して比較するべきであろう。それを勘案しても示されていることは、薬剤費の減少、手術・処置の増加である。また、検査、画像検査の比率がほとんど変わっていないことも興味深い。医療情報に関するものは、初診・再診料、各種管理料に埋め込まれていて、比率にも上がってこないことは残念である。

## 4. 日本の医療の現状

これらの観察から、日本の医療の誇るべき点は;
・どこにでも受診できる(場所、規模、紹介状の有無を問わない)
・誰でも受診でき、高レベル(少なくとも、中レベル以上)の医療が得られる
・保険加入を拒否されることはない
・事務手続きは病院・診療所がしてくれる(現物給付)
などであり、結果として、受診機会の増加、検査の増加などを通じ、世界有数の諸指標(平均寿命、感染症罹患率など)が達成されている。

にもかかわらず、医療が非常に安価に提供されていることを、国民が認識していないことが、一番の問題であろう。

これを改善するためには、客観的な指標が不可欠である。個々の医療行為のコストや、グロスとしての受診機会、検査回数などは、すでに広く普及した医事会計システムで示され、分析にも供されようとしている。これらの医療外形的な指標とともに、医療内容についての指標を出すことが、医療費を正当なレベルとするためには、国民から求められることは自明で、日本で広く普及しているオーダエントリシステムの持つデータを、インフォメーションにする必要がある。

## 5. 日本の医療情報の現状

日本では、病院全体のオーダエントリ普及率は6割、中でも400床以上の大病院では9割であり、これは先進国の中でも飛び抜けて高い。先に述べたように、診療報酬の他の項目に織り込まれている状態を考えれば、近視眼的にはコストセンターと思われても仕方がない状態でのこの高率は、著明と言える。その原因はいろいろと揚げられているが、筆者が重きを置く点は、まず処方などでの薬剤名取り違え防止など医療安全への貢献であり、他には患者待ち時間の著明な減少、取り漏れ検査・処置などの減少、Do処方(前回リピート)などの簡便、である。

これらのオーダエントリシステムが蓄えるデータのうち、処方・注射、検査結果、病名、患者基本、などは、平成22年の厚生労働省医政局通知により、データ形式の標準化が進められている。実際、平成23年3月末時点で、HL7形式でこれらの情報を出力できる病院情報システムは、723施設を数える(SS-MIXコンソーシアム調べ)。データをインフォメーションとするために、そのデータ形式の標準化が不可欠である。言い換えれば、上記種類のデータに関しては、インフォメーションとする基盤は揃いつつある、ということである。

## 6. 国民のニーズ

筆者が2008年に、静岡県の市民に対しておこなったアンケートでは、自分の診療情報を電子的に一つにまとめたい、とする意見は75%であった[5]。また、今回の東日本大震災の前、2007年に財団法人 全国地域情報化推進協会のアプリケーション委員会が、過去の災害において医療救護に向かった医療者におこなったインタビューでは、被災地で必要な情報として、過去の医師所見、検査結果などより、過去の処方歴こそが高い必要度であることが示されている[6]。

個人医療情報の機微さを考慮すれば、標準的に蓄積されたオーダエントリのデータをいかに活用するかについて、上記のような明らかに良い利用だけでなく、悪用からデータを守る、という役割も医療情報管理者は求められている。この点の議論は本大会の産官学共同セッションに譲るが、国民のニーズに呼応し、慎重な一歩を踏み出す時期に来ていることは事実である。

## 7. おわりに ー10年後の医療情報予測(2001)

筆者が2001年に各種講演で披露した、「10年後の医療情報予測」という一連のスライドが残っていた。2011年の今、この予測についての評価点をつけ、来

年の大会での第3部:未来編につなげたい。

【情報端末】
画面とキーボードというスタイルは主流ではなくなり、業務専門端末へ
医者はゲームのコントローラー
看護はPHS

30点:汎用端末としてのPCのコスト低下のためか、業務専用端末は医療ではあまりみられない。専用コントローラを求める高度なゲーム機器より、携帯端末、スマートフォンをプラットフォームにした安易なゲームの方が盛んになってきている。

【ネットワーク】
個別化、縮小化
情報の流れが目に見える運用が求められる

65点:クラウド化が進んでいる一方で、病院ネットワークをインターネットに繋がない施設が増えているのも事実である。レセオンラインの影響は大きい。

【情報公開】
Defensiveな医療が広がり、その弊害の認識で、公開の限界が意識されだされるか?

75点:Defensiveな医療はますます広がっている。最近は無闇に病院情報システムの相互参照を可能とした施設から、情報の洪水に対する危機感が訴えられ出した。

【医療情報ウェアハウス】
画像や診療録の電子的倉庫
管理の効率化を求めて始まり、付加価値のある情報の抽出が焦点になる

45点:画像、診療記録の電子的蓄積は予想通りのペースで進んでいるが、付加価値のある情報の抽出はまだまだ限定的である。

【医療行為の評価】
まずは、「他医から見られることを意識」程度から

75点:予想以上に進んだ、という評価である。臨床指標を先見的な施設が出し始めるところまできている。見られることの意識、というレベルは、院内でも電子化診療録によりあっという間に超えた。

【医師は患者との対話時間を増加し、PC操作時間は減少する】
この傾向は看護の方が顕著
一方、患者(外来入院とも)のPC操作、参照時間は増加する

35点:残念ながら、端末上での作業は増えるばかりになっている。患者が自らの情報へアクセスするケースもまだ限定的である。

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