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Defining type of contact in Medical Services Plan data in British Columbia

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Contents

2 About CHSPR

2 Acknowledgements

3 Executive summary

4 Background and objectives

- Types of contact
  - In-person contact
  - Virtual contact
  - Not a contact

6 Methods

- Data source
- Services of interest
- Creating type of contact categories
- Applying the categories

11 Results

13 Discussion

14 References

15 Appendix: Application

- How to categorize fee items
- Updating the formats: Extending to different years of data/different provider types

About CHSPR

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Acknowledgements

All inferences, opinions, and conclusions drawn in this report are those of the authors, and do not reflect the opinions or policies of the Data Steward(s).

Executive summary

In British Columbia (BC), information on physician services provided to individuals is captured in the Medical Services Plan (MSP) Payment Information file. Fee-for-service (FFS) is the predominant form of physician remuneration in BC,[1] whereby physicians bill for specific fee items, based on the service(s) provided. Historically, the set of billable fee items contained mostly in-person (physician-patient contact) services, but over time the list of fee items available to physicians has grown to include services provided by phone, email and virtual platforms, as well as services that do not involve patient contact, such as communication between providers regarding a patient's care. In order to understand changes in primary care service delivery over time we need to be able to define the type of contact.

We categorized the set of BC fee items billed by family/general practitioners (FPs/GPs) and medical and surgical specialists, excluding labs, into three categories that reflect:

1. In-person contacts between a patient and provider;
2. Virtual contacts (phone, email, telehealth); and
3. No interaction between a patient and provider.

To group fee items in the MSP data into these categories, we wrote a SAS program that creates a SAS format. When applied to the fee items this creates a variable capturing the type of contact.

We observe that the number of fee codes and total billings that do not correspond to an in-person contact have increased over time among family physicians. Non-in-person contacts, initially accounting for only 2.2% of total billings in 1996-97, have increased to 19.3% in 2017-18. There has also been an increase in fee codes and billings that do not correspond to an in-person contact among medical and surgical specialists, but the proportion is much lower at less than 5% of total billings over the same time period. The SAS program to create this format and the underlying Excel file are available upon request (see contact details on page 13 of this report). Since fee items change over time, the Excel file will be updated with new data when it becomes available. Please ensure you are working with the most recent version. Instructions are also given on how you can update the file yourself, if needed.

Pre-2020, this categorization may be useful for consistent descriptions of physician service use based on physician billing data over time, and to make comparisons with other jurisdictions where administrative data only capture in-person contacts. In addition, with the rapid shift to virtual contacts in 2020 due to the COVID-19 pandemic, having this method of identifying type of contact readily available for use will be invaluable in looking at shifts in service patterns in 2020 and beyond.

Background and objectives

The Medical Services Plan (MSP) covers medically necessary services provided to individuals eligible for the British Columbia (BC) provincial insurance program. Fee-for-service (FFS) is the predominant form of physician remuneration in BC, whereby physicians bill for specific fee items, based on the service(s) provided, and are reimbursed according to a set payment schedule.[2]

The MSP Payment Information Masterfile includes all FFS payments and some shadow ($0) encounter claims submitted where physicians are paid through other mechanisms. Historically the fee schedule contained mostly in-person (physician-patient contact) services, with some non-contact fee items (e.g. form fees, no charge referrals and premiums), but over time the list of fee items available to physicians has grown. Updates to the payment schedule include fee items to capture new services or service delivery methods (e.g. virtual care), reimbursement of previously non-reimbursed services (e.g. patient-physician or physician-to-physician phone calls or emails), greater compensation for more complex/more time-consuming patients (e.g. chronic disease and complex care incentives), and coordination with other care providers (e.g. case conferences).

In order to understand changes in primary care service delivery over time we need to be able to define the type of contact. This is particularly important for consistent descriptions of physician service use based on physician billing data over time, and to make comparisons with other jurisdictions where administrative data only capture in-person contacts.

Our objective was to distinguish between fee items that reflect:

1. In-person contacts between a patient and provider;
2. Virtual contacts; and
3. No interaction between a patient and provider.

This distinction in type of contact is important in describing primary care and specialist service use captured within physician billing data. As fees for virtual contacts and where no interaction between a patient and provider occurred have been added over time, identifying these is important for consistent comparisons over time within BC. Not all provincial fee schedules include codes for virtual contacts (especially prior to COVID-19) and where no interaction between a patient and provider occurred. If researchers are comparing service use to other jurisdictions, it may be important to exclude these fee codes.

In this report we describe the following:

- The three broad categories of type of contact;
- The data used in BC;
- The subset of MSP data for which we developed the categories;
- The process we went through to create those categories;
- The number of fee items and percentage of payments ($) in each category over time.

We also provide code that can be used for the same subset/same years of data for which it was initially developed, and offer guidance on how to extend this categorization to different years of data/different provider types.

Types of contact

As noted above, the three categories we wanted to create are:

In-person contact

Fee items corresponding to services that require in-person interaction between a patient (or in a few limited cases, family) and provider.

Virtual contact

Fee items corresponding to services that require interaction between a patient (or in a few limited cases, family) and provider by phone, telemedicine platform, or email.

Not a contact

Fee items corresponding to other activities that do not involve interaction with patients/families (i.e. communication with other care providers, discharge planning), such as:

- No charge referrals (referrals are submitted by the referring physician either on a FFS claim, or if no FFS claim is being submitted, with a 'no charge referral'[2] so that the specialist will get paid at the specialist rate for the patient visit);
- Fees for completion of forms (e.g. WorkSafeBC) and tray fees; and
- Premiums/payments that would be billed in addition to a contact and do not correspond to an additional care process (i.e. could not have been billed on their own). This includes, for example, surcharges/call-out charges, and incentives such as the annual complex care management fees that are billed in addition to visits.

In addition to performing this categorization on a one-time basis for the years of data presently available, we wanted to develop a process that would make this easier to implement on an ongoing basis across other projects and additional years of data.

Methods

Data source

The MSP Payment Information file data captures FFS payments made to physicians, and encounter claims if submitted for services provided by physicians who are paid for through Alternative Payment Plans (APP).[3] MSP data contain elements on:

- Date (service date, maybe paid date depending on data release);
- Demographic information;
- Clinical information (ICD9);
- Administrative information (e.g. personal health number (PHN), practitioner number, type of service location, paid amount, number of service units); and
- Service information (e.g. billed fee item, service code (groupings of fee items), claim specialty, service location code).

Physicians enter *fee items* to capture the specific service that they offered. Fee items were initially 4-digits, but 5-digit fee items were introduced in 1996-97, and many more 5-digit codes became available in 1997-98 with a restructured payment schedule.[4] Thus since 1996-97 the fee items are up to 5-digit numbers, typically stored as character and padded with leading zeroes if needed (e.g. '00100' is *Visit - in office (age 2-49)**).

Service codes are broad groupings of fee items, and group fee items by service type (e.g. '01' *Regional Examinations*), location (e.g. '07' *Institutional Visits*), provider type (e.g. '13' *Midwifery*), funding arrangement (e.g. '67' *APB Encounter Records*) or payment type (e.g. '09' *Visit Premiums*).

Services of interest

Our main interest was in counting and categorizing contacts (and subsequently determining location of in-person contacts) with FPs and medical and surgical specialists.** We excluded labs (that is, service codes '93' *Pathology (category 1)* and '94' *Pathology (beyond category 1)*) and fee items billed exclusively by imaging specialists. The years of data available and used for this initial categorization were 1996-97 to 2017-18 but have since been extended to 2020.

Creating type of contact categories

Rather than trying to categorize the approximately 2,500 individual fee items individually, we began by categorizing approximately 50 service codes (and by consequence all the fee items contained within them) by type of contact. For example, we could assume that most of the fee items contained in service code '01' *Regional Examinations* should be categorized into 'in-person contact'.

* Some fee items like this example have changed age range over time, but the kind of service it captures has not changed (i.e. this one has always been an in-office visit). Please note that all fee item labels are from one point in time and will not capture such changes. The MSP Payment Schedule appropriate for your year(s) of data should be consulted if exact fee item labels are required.

** Claim specialties are as follow. GP/FP: 00. Medical specialists: 01 Dermatology, 02 Neurology, 03 Psychiatry, 04 Neuropsychiatry, 14 Paediatrics, 15 Internal Medicine, 19 Paediatric Cardiology, 20 Physical Medicine & Rehab, 21 Public Health, 23 Occupational Medicine, 24 Geriatric Medicine, 26 Cardiology, 28 Emergency Medicine, 44 Rheumatology, 45 Clinical Immunization and Allergy, 46 Medical Genetics, 49 Respirology, 51 Endocrinology, 53 Critical Care Medicine, 54 Pain Medicine, 55 Radiation Oncology, 56 Gastroenterology, 57 General Internal Medicine, 59 Nephrology, 67 Infectious Diseases, 74 Hematology Oncology. Surgical specialists: 05 Obstetrics and Gynaecology, 06 Ophthalmology, 07 Otolaryngology, 08 General Surgery, 09 Neurosurgery, 10 Orthopaedic Surgery, 11 Plastic Surgery, 12 Cardio & Thoracic Surgery, 13 Urology, 18 Anaesthesia, 47 Vascular Surgery, 48 Thoracic Surgery.

However, the grouping of fee items into service codes has changed over time. While most fee items are consistently coded into service codes, some fee items are re-classified to different or newly created service codes over time. Some fee items have been moved more than once. For example, the initial set of population-based funded fee items and Alternative Payment Branch (APB) fee items were first grouped into service code '08' *Miscellaneous and Other Visits (GP)* prior to the categories '66' *Primary Health Care Encounter Records* and '67' *APB Encounter Records* being created. Therefore, in earlier years of data, these fee items fall under service code '08'; whereas, in newer years they fall under service code '66' or '67'. As well, some fee items are occasionally coded with the incorrect service code (although the number of these are small). For example, '00100' *Visit - in office (age 2-49)* is almost always coded into '01' *Regional examinations,* although there are instances of it being coded into '03' *Complete Examinations,* '04' *Counselling,* etc. However, since for the most part fee items are consistently coded into service codes, and the service codes themselves are fairly logical categories, this was a valuable starting point.

Prior to using service codes as the first step for defining type of contact, the data needed to be 'corrected' so that all fee items were consistently grouped into the most appropriate service code only. Otherwise, there would be additional cleaning to do for stray fee items that were incorrectly coded to the wrong service code or fee items that were grouped into different service codes over the years. To correct for the different classification of fee items into service codes over time, all years of available data were used and all fee item-service code combinations were found. The most frequent fee item-service code combination in the most recent year of data where that fee item was present was selected as the 'correct' service code classification. To ensure this was the best service code classification for each fee item, the most frequent/most recent fee item-service code combination was compared to the most frequent fee item-service code combination over all the available years and any differences were examined. Based on this work, a format was created that classifies fee items into corrected (i.e. consistent) service codes. Researchers interested in using this format on their data may request the program to create the format and the most-recently updated version of the fee item-service code classification Excel file (see contact details on page 13 of this report). Once the short program has been run (see the Appendix to this report for details), the code to create corrected service code is simply:

```
ServCode1 = put(feeitem, $fitm_SC.);
```

These corrected service codes were then used as the first step in grouping fee items into type of contact. The initial classification is shown in Table 1.

However, using this broad-stroke approach, some fee items get misclassified. Excel files containing this 'first cut' type of contact assigned using (corrected) service code only were prepared, and the fee item and fee item label were examined in conjunction with fee item guides (to provide more information on the fee items beyond the short label) by two data experts and a physician, to determine which fee items needed to be moved to different categories. For example, fee item '13017' *Telehealth GP out-of-office Visit* was initially assigned into "in-person contact" based on its grouping under service code '01' *Regional Examinations.* However, upon examination, this fee item was re-assigned to "virtual contact".

Another example: while many of the fee items under '12' *GPSC – GP Services Committee* are incentive payments or premiums billed in addition to in-person visits, a subset are billed in place of other visit fee items (for example: '14044' *GP Mental Health Management fee age 2–49).* All General Practice Services Committee (GPSC) fee items that involve in-person interaction between a care provider and patient or family were re-assigned to "in-person contact". To be clear, this reassignment is done with fee items that fall into the service codes, so the whole service code is not re-classified, rather particular fee items that are

Table 1. Initial classification of service codes into type of contact

In-person contact
01 Regional Examinations
02 Consultation
03 Complete Examinations
04 Counselling
05 Home Visits
06 Emergency Visits
07 Institutional Visits
08 Miscellaneous and Other Visits (GP)
10 Critical Care Services - General Practice
11 Prolonged or Extended Visit
13 Midwifery
15 Specialist Services Committee
16 SSC II - LMA fees
22 Consultation (full minor repeat, specialist)
23 Subsequent Visits (specialists)
24 Counselling Psychotherapy (specialists)
25 Home Visits (specialists)
26 Emergency Visits (specialists)
27 Institutional Visits (specialists)
28 Miscellaneous and Other Visits (specialists)
30 Specialists Critical Care Services
40 Anaesthesia
41 Cardiovascular listing
42 Obstetrics
43 Surgery (non-minor, excisional)
44 Minor Surgery, Minor Ther. Procedures
45 Unlisted Miscellaneous Surgery
46 Dialysis/Transfusions
47 General Services (non-invasive tests, proc.)
48 Therapeutic Radiation
89 Diagnostic Ophthalmology
90 Diagnostic Radiology
91 Diagnostic Ultrasound
95 Pulmonary Function
96 Electrodiagnosis
97 Procedural Cardiology
98 Other (needle biopsies, 0x99 etc.)
99 Miscellaneous or incentive items
65 Nurse Practitioner
66 Primary Health Care Encounter Records
67 APB Encounter Records
92 Nuclear Medicine
Virtual contact
No service codes initially categorized here
Not a contact
09 Visit Premiums
12 GPSC - GP Services Committee
14 Pharmaceutical Services
17 GP incentives & other management fees
19 No Charge Referral
29 Visit Premiums (specialist)
49 Procedural Premiums
60 Form Fees and WCB Misc Items
68 Sessional Encounter Records[a]
71 Tray Service Items
Excluded
93 Pathology (category 1)
94 Pathology (beyond category 1)

[a] Includes, for example, literature review, clinical team meeting.

grouped into those service codes are reassigned, while others (the majority) stay where the service code was initially classified. For example, of the 48 fee items grouped under service code '01' *Regional Examination,* two were reassigned to "virtual contact", while 46 remained as "in-person contact". As another example, of the 102 fee items grouped under service code '66' *Primary Health Care Encounter Records,* 11 were reassigned to "virtual contact", 32 to "not a contact" and 59 remained as "in-person contact".

Table 2. Sample of final classification of fee items grouped in type of contact. Total counts of fee items include those billed by FPs and medical and surgical specialists.

Type of contact	Service code examples	Fee item examples
In-person contact	01 Regional Examinations	00100 Visit in office
		13200 Visit – out of office
		13763 GP group medical visit fee per patient, per 1/2 hour – 3 patients
		… (46 fee items in total)
	02 Consultation	00110 Consultation (in or out of office)
		00116 Consultation, special in-hospital
		… (15 fee items in total)
	03 Complete Examinations	00101 Complete examination in office
		13201 Complete examination – out of office
		… (16 fee items in total)
	… (47 Service codes in total)	… (5,022 fee items in total)
Virtual contact	01 Regional Examinations	13017 Telehealth GP out-of-office Visit
		13037 Telehealth GP in-office Visit
	02 Consultation	13016 Telehealth GP out-of-office Consultation
		13036 Telehealth GP in-office Consultation
	66 Primary Health Care Encounter Records	96016 PHC-Telephone contact – New problem
		96149 PBF GP Mental health telephone/email mgmt. fee
		… (11 fee items in total)
	… (21 Service codes in total)	… (193 fee items in total)
Not a contact	09 Visit Premiums	01200 Call-out charge – evening
		01205 Surcharge – non-operative – evening
		… (9 fee items in total)
	12 GPSC - GP Services Committee	13050 Incentive for full service GP – annual chronic care bonus
		14070 GP Attachment participation
		… (18 fee items in total)
	66 Primary Health Care Encounter Records	96090 PHC-Primary care registration
		96117 PBF GP Acute care discharge conference fee
		96118 PBF-GP Urgent tele. Conference with a specialist
		… (32 fee items in total)
	… (26 Service codes in total)	… (221 fee items in total)

Fee items that needed to be reassigned to a different category based on this review were collected in Excel sheets, and these were read into SAS and applied as a 'fine tuning' to the initial type of contact that was created using service codes alone. Finally, all the fee items grouped within these final categories were output to separate Excel sheets, one for each type of contact. While the full tables are too long to include here, a sample of the fee items included in each type of contact are shown in Table 2.

A small SAS program was created that reads in these Excel sheets and from that information a format is created that can be easily applied to the MSP data in a SAS program as follows (see the Appendix for details):

```
toc = put(feeitem, $tocg.);
format toc $tocl.;
```

The resulting toc variable can have the following categories: '1' *Contact, in person,* '2' *Contact, virtual,* '3' *Not a contact,* and '9' *Unclassified – examine* for any fee items that did not get grouped. See the section on updating the format if any '9' occur in your data. These Excel sheets and the small program can be shared between different projects (i.e. they can be removed from the PopulationData BC Secure Research Environment (SRE) and imported into other SRE projects) to easily find type of contact across projects, for MSP data containing FP or specialist services, excluding labs and imaging. The SAS code and Excel sheets* are available upon request (contact information on page 13 of this report).

Applying the categories

The type of contact format was applied to the FP, medical and specialist MSP claims (excluding labs) from 1996-97 to 2017-18. Within each type of contact category and year, for FPs and specialists, the number of unique fee items, total number of records (counting unique combinations of patient-provider-day-feeitem) and total amounts paid were found. Encounters, defined as unique patient-provider-day interactions, were also counted by type of contact and year. If more than one type of contact was found on records for a patient-provider-day interaction, then the following decision rules were applied:

- If any record for that patient-provider-day interaction was an in-person contact, that encounter is counted as an in-person contact (e.g. if both a visit and an incentive were billed on the same day);
- In the absence of an in-person contact, if any record for that patient-provider-day interaction was virtual, that encounter is counted as a virtual contact (e.g. if both a phone call and a no charge referral were billed on the same day);
- If the only records billed on a patient-provider-day were records categorized as 'not a contact', then that patient-provider-day billing encounter is counted as 'not a contact'.

* As the Excel file is updated with additional years, the file name will reflect that. For example, the most recent version as of the writing of this document is called feeitems_by_type_of_contact_9697-1718.xlsx.

Results

The following summary statistics are for records with claim specialty = FP, excluding labs (service codes 93 and 94) using data from 1996-97 to 2017-18.

The number of unique virtual fee items billed by FPs increased from none in 1996-97 to 31 in 2017-18, while the number of unique fee items that were not contacts rose from 30 to 142 over the same period.

The proportion of billed records that are for in-person contacts has decreased over time, from 94.9% in 1996-97 to 82.4% in 2017-18 (Figure 1). This was expected as the number of available fee items that capture virtual interactions or payments for other activities has increased.

Figure 2 shows stacked payments, where it can be seen that payments for virtual contacts contribute only a small amount to overall payments (from 0% to 1.1% over 1996-97 to 2017-18); while payments for non-contacts (e.g. incentives) have increased greatly, with initial slow growth from 2.2% to 5.3% of total billings in the years 1996-97 to 2005-06, then increasing steadily to 18.2% of total billings in 2017-18.

Figure 1. Percent of records billed by FPs, excluding labs, in each type of contact category, 1996-97 to 2017-18

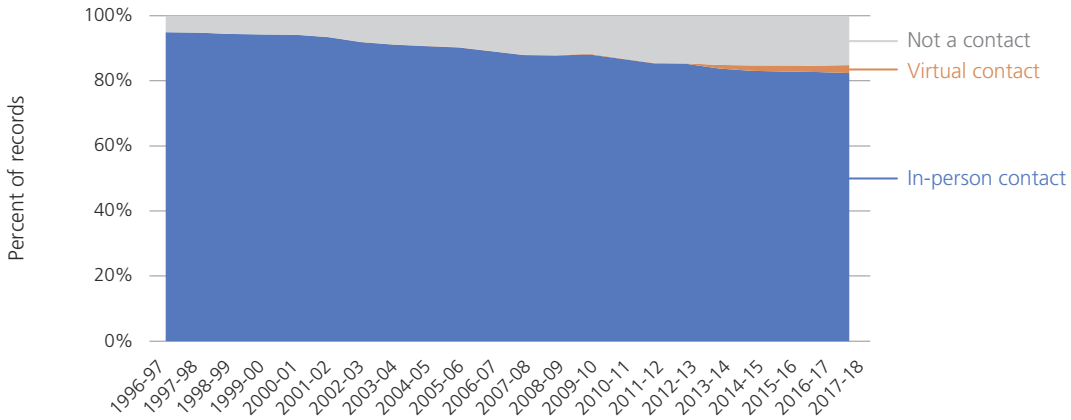


Figure 2. Total annual FP payments (CAD$), excluding labs, by type of contact category, 1996-97 to 2017-18

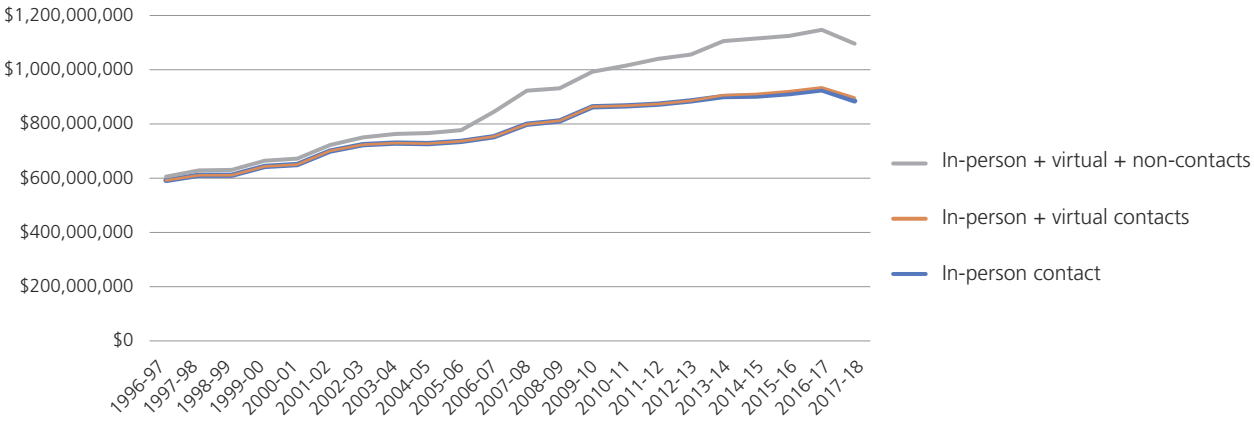


Figure 3 shows the number of encounters with FPs, where encounters are defined as unique patient-provider-day interactions. While the number of additional 'non-contact' patient-provider-day billing encounters is not as high as payments (partially due to applying the decision rules to count each patient-provider-day interaction in one category only), it is not insubstantial. If one counted the non-contacts as "visits" in addition to the in-person and virtual visits, one would over-count the number of visits by 1.5% to 5.5% from 1996-97 to 2017-18.

Medical and surgical specialists have seen a similar increase in the number of non-in-person fee items, but the change in billing patterns is smaller. The number of unique virtual fee items billed by medical and surgical specialists rose from zero in 1996-97 to 143 in 2017-18, while the number of unique fee items that were not contacts rose from 30 to 95 over the same period. Compared to FPs, there was smaller growth in payments for fee items that are not in-person contacts (Figure 4). Payments to specialists for non-contacts remained close to 4% in all years from1997-98 to 2017-18, while payments for virtual contacts remained below 1% in all available years.

Figure 3. Total annual FP encounters, excluding labs, by type of contact category, 1996-97 to 2017-18

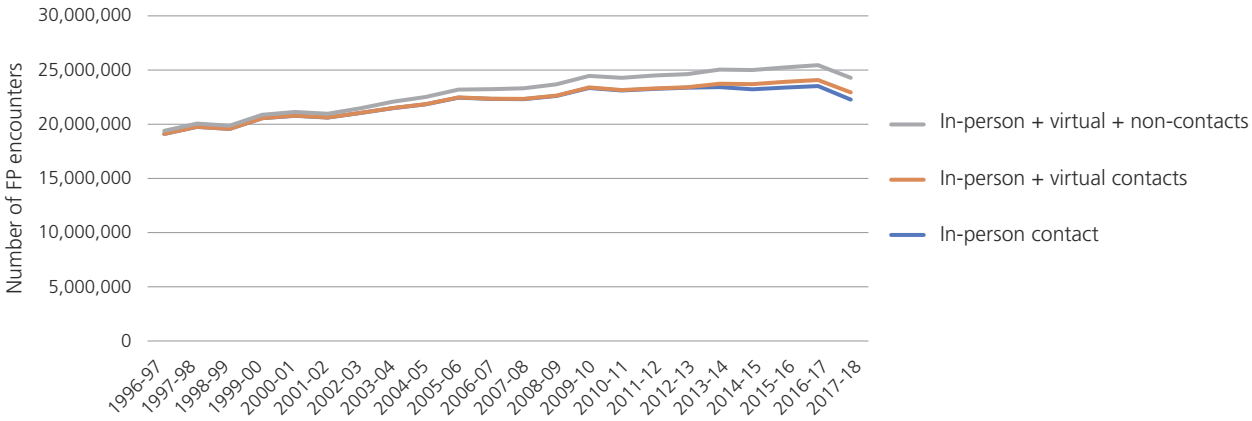
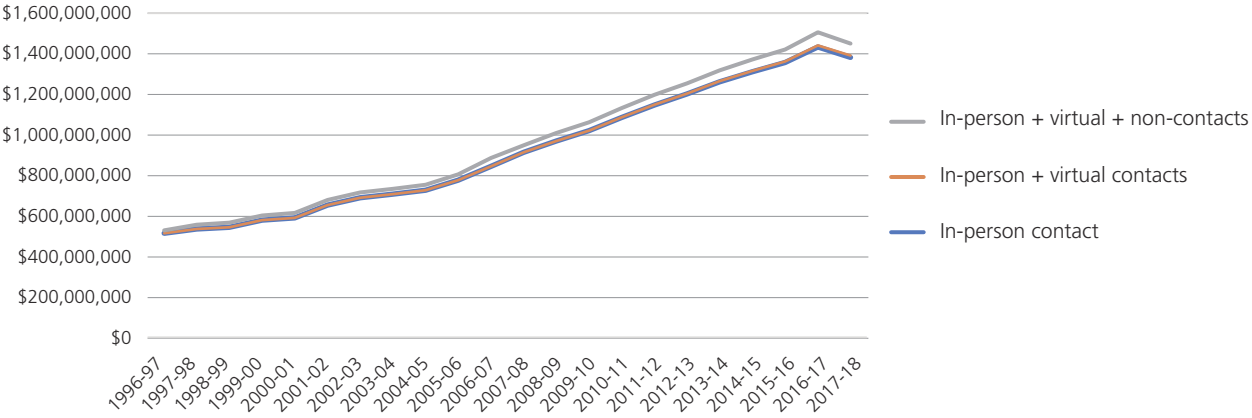


Figure 4. Total annual medical and surgical specialist payments (CAD$), excluding labs, by type of contact category, 1996-97 to 2017-18



Discussion

The methods described above categorize almost 5,500 fee items that are billed by FPs, medical and surgical specialists into three groups which describe the type of contact—in-person, virtual, or not a contact—and can be successfully used to describe shifts in billings over time. However, it should be noted that limitations of this categorization exist, and include:

- Only fee items for years 1996-97 forward are grouped; the fee item codes used in 1995-96 and earlier have not been categorized;
- Limited documentation for some fee items, making it difficult to categorize based on the available short label only, thus some fee items may be misclassified;
- Some fee items contained elements of more than one type of contact, but were slotted into one category only; and
- The type of contact for some fee items depends on the perspective—e.g. a conference with a family member of a patient, billed under the patient's Personal Health Number (PHN), might not be a contact from the patient's perspective (that is, that patient did not see the physician), but might be a contact from the physician's perspective.

Despite these limitations, given the growth in the number of fee items and billings that do not correspond to an in-person contact, especially among FPs, this categorization may be useful for achieving more consistent descriptions of physician service use based on physician billing data over time (pre-2020) and with jurisdictions where administrative data only capture in-person contacts in this period. If all BC fee codes we classified as non-contacts were considered "visits", one would over-count the number of visits by 1.5% to 5.5% from 1996-97 to 2017-18.

In addition, in the context of the COVID-19 pandemic, there was a rapid shift to virtual contacts in early 2020. This foundational work is easily up-dateable and available for use to look at shifts in service patterns, including virtual care, in 2020 and beyond.

For the most recent type of contact program and Excel file, or the additional files for creating consistent service code groupings or updating the work yourself, please contact: chspr.reception@ubc.ca.

References

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3. BC Ministry of Health [Creator]. Medical Services Plan (MSP) Payment Information File. Population Data BC [Publisher]; 2019. Available from: *https://www.popdata.bc.ca/data*
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Appendix: Application

How to categorize fee items

To group fee items into the type of contact categories, follow these steps:

1. Copy the most recent versions of the following files to your SRE project (or edit appropriately if you are not working on the SRE) and save in location R:/working/fmtlib:
   - *feeitems_by_type_of_contact_9697-1718.xlsx, and*
   - *mk_fitm_to_toc_fmt.sas**
2. Run the SAS program. (Check log to ensure ran without errors).
3. Now, the format $tocg is available for use in the format library (R:/working/fmtlib).
4. Ensure you have the following lines of code in the program in which you wish to use this format:
   libname fmtlib 'R:\working\fmtlib';
   options fmtsearch=(fmtlib);
   proc format;
   value $tocl '1'='1 Contact, in-person'
   '2'='2 Contact, virtual'
   '3'='3 Not a contact'
   '9'='9 Unclassified - examine';
   run;
5. Within your MSP dataset, the following code will create the type of contact variable:
   toc = put(feeitem, $tocg.);
   format toc $tocl.;
   label toc='Type of Contact';

   The toc variable created will have the categories of: '1' Contact, in person, '2' Contact, virtual or '3' Not a contact, and '9' Unclassified – examine for any fee items that did not get grouped. See the section on updating the format if any '9' occur in your data. Note if you neglected to exclude labs, they will end up in category '9'.

To group fee items into consistent service codes over multiple years of data, follow the steps below. Note that while this grouping was used in the initial steps of categorizing fee items, this format is not required for creating the final type of contact variable. However, it might be useful for other purposes:

1. Copy the most recent versions of the following files to your SRE project and save in location R:/working/fmtlib:
   - *feeitem_servcode_history_9697-1718.xlsx,*
   - *mk_fitm_to_servcode1_fmt.sas***
2. Run the SAS program. (Check log to ensure ran without errors.)
3. Now, the format *$fitm_SC* is available for use in the format library (R:/working/fmtlib).
4. Ensure you have the following lines of code in the program in which you wish to use this format:
   libname fmtlib 'R:\working\fmtlib';
   options fmtsearch=(fmtlib);
5. Within your MSP dataset, the following code will create the consistent service code variable:
   ServCode1 = put(feeitem, $fitm_SC.);

* Code for this SAS program is contained in the Excel file *feeitems_by_type_of_contact_9697-1718.xlsx*, in tab *program*.

** Code for this SAS program is contained in the Excel file *feeitem_servcode_history_9697-1718.xlsx*, in tab *program*.

format ServCode1 $servcdl.; (or whatever your service code labelling format is called);
label ServCode1='Consistent Service Code';

Look for any fee items with a missing ServCode1. These fee items will need to be added to the format. See instructions for updating the format below.

Updating the formats: Extending to different years of data/different provider types

Extending this categorization to different years of data (e.g. earlier years or years after 2017-18) or to different data extracts (e.g. one that contains ICBC or WorkSafeBC claim types or records associated with abortions, all of which are excluded from the standard MSP data extracts), will be much simpler than the original process that was described above. The following steps should be implemented:

1. Follow the above steps to set up $fitm_SC and $tocg in the format library (R:/working/fmtlib).

2. The user may choose to update the Service Code correction format for new fee items only,* an alternative to this is described below. While some thought was put into getting this format as correct as possible (so it could be used for other purposes as well), this care isn't absolutely necessary. What is important is consistently grouping the **new** fee items into one, and only one, service code, so finding the most frequent-most recent and just using that is good enough. Any errors made at this point in miss-placing a fee item will be corrected below with the Excel file review.** Alternatively, the user may just wish to deal with fee items that get categorized into more than one service code as described below in step 5b. If you choose to update the Service Code correction format with new fee items, follow the program steps provided in *feeitem_servcode_history_9697-1718.xlsx*, tab *update*.

3. Find 'toc' using the existing $tocg format.

4. Any records that get categorized to '9' *Unclassified - examine* should be reviewed. The only fee items that will get categorized to '9' would be those that are not in the three prepared Excel sheets, meaning they were not in the data extracts used to create the file. For this step and step 5, see the example program provided in *feeitems_by_type_of_contact_9697-1718.xlsx*, tab *update*.

5. Create a new dataset with just the records with toc='9'. For that set of data, do the following:
a) If the user updated the Service Code correction format, then create the corrected service code variable (using the updated format):
ServCode1 = put(feeitem, $fitm_SC.);
format ServCode1 $servcdl.; (or whatever your service code labelling format is called);
And then proceed to 5c.

* Note this is **not a complete** update of the fee item to service code format, since a complete update could result in some of the existing fee items being moved to new services codes. To explain, e.g. if in 2018-19 a new service code was created that captured fee items that used to be captured under a different service code, a complete update would then place all the impacted fee items into the new service code. This would complicate the type of contact macro, since it was built for **existing** fee items based on where existing fee items were grouped in the initial work (which used 1999-00 to 2015-16 data).

** For example, if we had accidentally classified a visit into '09' *Visit Premiums,* it would initially get put into toc1=*not a contact*, but on review would be identified and reassigned to toc=*in-person contact*.

b) If the user chose not to update the Service Code correction format, do a sort nodupkey by fee item & service code (that is, keep just one record per fee item-service code combination) and examine any fee items that get grouped into more than one service code. Choose the best service code and either recode all records containing that fee item to have the chosen service code (e.g. with if then statements) or delete the record containing the service code you did not choose. Rename ServCode to ServCode1.

c) Do a sort nodupkey by fee item code (that is, keep just one record per fee item)

d) Create the first cut toc1 variable using the format* that groups these corrected service codes:
toc1=put(ServCode1, $toc1g.);
format toc1 $tocl.;

e) Output to Excel the following variables (do one sheet for each toc1): corrected service code, fee item number, and fee item label. Review, to determine if the fee items are in the correct category, or if they need to be moved to a different category. If adjustments are needed, copy/paste the rows to the correct Excel sheet. Ensure no rows are deleted (including those that based on toc1 are in the correct category). Once finalized, ALL these rows should then be appended to the appropriate sheet in the file *feeitems_by_type_of_contact_9697-1718.xlsx,* updating the filename extension to reflect any additional years used.

6. The SAS program that creates the $tocg format can then be rerun (to recreate $tocg) using these updated sheets.**

7. The variable toc can be recreated in your data using this updated format.

8. After this process, no records should get categorized as toc='9'. If some occur, a fee item was accidentally dropped (likely in the copy/paste process). Repeat the process until no toc='9' remain.

9. Please share the Excel sheets you have updated with others who may be using this format, to save repetition of work. Please update the history notes tab to help clarify what additional data has been included. You can contact us at: chspr.reception@ubc.ca.

* $toc1g format is contained in the *feeitems_by_type_of_contact_9697-1718.xlsx* Excel file, see sheet 'toc1'.

** To be clear, these sheets contain all the original fee items generated by the work we did (using MSP data 1996-97 to 2017-18, claim type 'M" (including FP and medical/surgical specialist claims), excluding labs), plus the fee items new to the specific set of data you are using, all categorized into the correct type of contact.

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