

The e-Network Solution for Mental Health and Addictions Information Management

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Abstract

ConnexOntario Health Services Information's genesis was over 18 years ago. Back then, it was known as the Drug and Alcohol Registry of Treatment (DART). At that time, it was – and remains today – an innovative initiative that acted as an e-network solution for mental health and addiction information management. Using state-of-the-art technology and professional information management standards, DART was designed to offer a form of electronic healthcare by way of resource matching and referral for those who were seeking treatment for substance abuse problems. DART was also designed as a means to help improve the alcohol and drug treatment system in Ontario by providing easily accessible, up-to-date and accurate data about the availability of those services.

This paper explores the development and growth of DART through its metamorphosis into ConnexOntario. Acting as a hub to the electronic network, the computerized database housing the Registry information provides the platform upon which information is shared amongst service providers, professionals, planners, government officials and members of the general public.

Background

In May of 1991, the Ontario Ministry of Health and Long-Term Care (MOHLTC) (formerly the Ministry of Health) requested that the Centre for Addiction and Mental Health (CAMH) (formerly the Addiction Research Foundation) develop a Registry of treatment services for drug and/or alcohol problems in Ontario. This was to be a three-year demonstration project. (For a more detailed description of the DART program, see Rush, Vincent and Chevendra [1993]).

The rationale for this initiative, as provided by Rush and Chevendra (1994), included a number of identified needs for easily obtainable, reliable information about the availability and type of alcohol and drug treatment throughout Ontario. In 1990, Ontario residents were using out-of-country treatment services at an escalating rate, costing the Ontario Health Insurance Plan (OHIP) close to \$50 million annually (Rush et al. 1993). Questions arose as to whether Ontario's treatment system was being underutilized and/or whether the extensive use of the American treatment system indicated a shortage of specific types of treatment in Ontario. Rush and Chevendra (1994) referenced reviews by Martin (1990) and Mammolitti (1991) regarding an issue where members of the public and

service providers were having difficulty locating and/or accessing appropriate services in Ontario. A need existed for a more system-focused, provincial planning model of care delivery.

This Registry project, known as DART, was to fill a number of different needs. DART was to become part of a provincial approach to reduce out-of-country treatment for drug and/or alcohol abuse by playing an integral role in the newly-developed OHIP prior approval process. This process involved an assessment of the individual at a designated assessment and referral centre, input from a licensed physician in Ontario, a search for treatment options through DART, and official approval from OHIP before out-of-country treatment could be started (Rush et al. 1993). DART also provided information to professionals about the availability of services in Ontario for the cases they were working on. For system planning, gaps in the treatment system were identified through aggregate profile data about individuals seeking treatment through DART and were available for use by the MOHLTC and other planners. Detailed descriptive information about treatment services was also available.

Methodology

All of the aspects of the prior approval process were to be operational within four months. Therefore, DART had a short time frame for development. Implementation progressed through three phases:

Implementation Phase One

A four-month development phase began in June 1991. Following are the critical tasks that were accomplished during this phase, as outlined by Rush et al. (1993). An External Advisory Committee was created, which consisted of representation from key stakeholders. This group provided input directly to the design, policy and procedures of the Registry project. PricewaterhouseCoopers (formerly Price Waterhouse) was contracted to manage the project, which involved accessing the talents of an estimated 100 CAMH employees. CAMH in-house expertise was used for all aspects of the project, including:

- design and installation of communications software and hardware;
- development of promotional materials, and the development and implementation of a communications strategy;
- design and development of an Oracle relational database to house an inventory of all drug and/or alcohol treatment services in Ontario funded by the MOHLTC and other Ministries;
- development and administration of a service-specific survey instrument through face-to-face interviews with the organizations from which detailed program information was captured;
- compilation of the database with up-to-date, detailed

descriptions of services, including referral and admission procedures, service availability, service locations, contact information, legal issues, target populations, and more;

- planning and carrying out of community consultations;
- development of program policy and procedures and the design of the Registry's evaluation; and
- management of the purchasing and contracting of outside services for leasehold improvements to the facility.

Implementation Phase Two

The development phase was followed by an eight-month pilot phase. During this pilot phase, improvements were made in all areas (i.e., technology, process, phone protocols, etc.) as they were identified. Interactive Voice Response (IVR) technology was used to capture availability data from the organizations that provided this information on a regularly scheduled basis. Professionals used a provincial, toll-free telephone line to contact DART, and operations were from 9 a.m. to 5 p.m., Monday through Friday.

Information and Referral Specialists (IRS) who answered the calls used relevant information obtained from the caller to search the electronic database of information. A computerized algorithm designed to match appropriate resources based on the caller's need returned search results for review and referral purposes. Based on information from the caller, the IRS was able to influence the order in which the search results were returned. Service information was returned geographically, with the treatment options located nearest to the individual coming up first. Services could also be displayed in the order of availability, to accommodate individuals where immediacy of treatment was more important. Non-identifying caller information was collected and stored in the database. Interestingly, the same basic search methodology remains in use today.

Implementation Phase Three

In June 1992, a two-year operational phase began. The database inclusion criterion was expanded shortly after the end of the operational phase of the pilot project to include organizations that received funding from municipal governments. Therefore, an organization was included in the DART database if it met the following criteria:

- the organization received funding (in whole or in part) from the federal, provincial or municipal governments;
- the organization offered a specialized treatment service for individuals with alcohol and/or drug problems; and
- the organization accepted referrals from the community.

The final evaluation of the DART project was completed at the end of the third phase of the three-year demonstration pilot in 1994. The evaluation was favourable, particularly with

regard to DART's participation in the OHIP prior approval process. Rush (1992) referred to OHIP statistics that indicated fewer residents of Ontario had received substance abuse treatment in the United States since the prior approval process was implemented. This, of course, also meant that less tax money was being spent on out-of-country treatment. DART played an essential role in this process.

DART graduated from a pilot project to a full program with ongoing, transfer payment agency funding from the MOHLTC.

Service Expansion

The DART program paved the way and provided a solid foundation upon which *ConnexOntario* could expand:

1995 – Public Access and Divestment

An evaluation of the first year of the operational phase of DART (Rush and Chevendra 1993) revealed that, although DART had not promoted its services to the public, a significant number of calls were received from substance abusers and their families or friends. A feasibility study was completed to assess the viability of opening the service to the general public, which provided a model for public access that would meet the needs of the public, while also addressing the major concerns identified by key informants.

In October 1995, DART expanded its mandate to include public access to the toll-free telephone line. The service continued to be confidential and anonymous, and the hours of operation were expanded from 9 a.m. to 9 p.m., Monday through Friday. When dealing with members of the general public, DART staff provided general substance abuse treatment education when required and directed callers to designated assessment and referral centres for a comprehensive assessment and treatment planning. However, if the caller was considered to be impaired, the IRS directed him or her to the closest detoxification centre. DART staff members were not to take on the role of assessing the caller from a clinical perspective, nor were they to engage in crisis counselling or prolonged problem-solving.

Also, in 1995, DART divested from CAMH to become a free-standing organization with a provincial Board of Directors, composed of persons providing geographic representation as well as membership from the various service sectors.

1997 – Ontario Problem Gambling Helpline (OPGH) and Online Directories

In 1997, in response to the expansion of gambling in the province of Ontario, DART was funded by the MOHLTC to develop a Registry of problem gambling services. Using the development and operational practices of DART as a blueprint, the Ontario Problem Gambling Helpline (OPGH) was created and began operation in September 1997. A second toll-free, confidential and anonymous phone line was added. The hours

of operation for the OPGH were established as 24 hours a day, seven days a week.

In 1997, DART announced another method for the public and professionals to access information about the treatment services with the launch of an online, searchable directory that would produce search results based on location (i.e., city, town, etc.), type of service (i.e., residential, detoxification, assessment, etc.), target population (i.e., women, youth, Aboriginals, etc.) and/or name of the organization or program.

1999 – Oracle Database Redesign

During the 1999/2000 fiscal year, a process for redesigning the database was initiated in order to accommodate a new set of provincial service categories, put into operation by the MOHLTC. This redesign also ensured improvements to the call progression screens that aided the IRS in responding to calls received over the toll-free lines. International Business Machines (IBM) was contracted to do an analysis of existing business processes, to develop a Business Requirement Plan, and for further design activity and rewriting of the database.

2003 – Mental Health Service Information Ontario (MHSIO)

In 2003, the MOHLTC began to fund DART to develop a Registry containing an inventory of mental health services that would be known as Mental Health Service Information Ontario (MHSIO). The MOHLTC, in the 2008 Auditor General of Ontario's report on Community Mental Health, recognized that there was a need to have a central hub of mental health service information that would be electronically networked so as to be accessible by the public and professionals for referral and planning. The DART blueprint was used again – with necessary modifications – to develop MHSIO, and the service became operational in December 2005. At that time, the corporation became known as *ConnexOntario* Health Services Information operating three services: DART, the OPGH and MHSIO.

2006 – ConnexOntario eServices

In August 2006, *ConnexOntario* eServices was released. Developed in-house, eServices is an extranet application that offers a platform from which participating organizations, Local Health Integration Networks (LHINs), the MOHLTC, and other key stakeholders may access detailed database information, update requisite information online, generate real-time reports, display interactive maps showing inventories of all or selected services by LHIN, and view dashboards of availability, wait-times, profile statistics and other sector overview information.

2007 – ConnexOntario OPGH Core Service Enhancements

On a three-year pilot basis, *ConnexOntario* is working with

seven problem gambling assessment organizations in the province on a direct appointment-booking approach to information and referral. Problem gambling counsellors from the organizations participating in the pilot share their appointment books with ConnexOntario. Callers to the OPGH, if they wish, may be immediately given an appointment for assessment. The Auditor General (2008) highlighted the efforts of the MOHLTC in funding this pilot as a means of increasing the effectiveness of the Helpline. The success of the pilot to date has resulted in the MOHLTC expressing its intention to provide funding to expand the service province-wide.

2008 – ConnexOntario Webchats

During 2008, MHSIO piloted the use of webchats as an alternative method for members of the public and professionals to access ConnexOntario information and referral services. The success of this pilot has led to the use of webchats by DART and the OPGH. A webchat link is available for each service from its corresponding public website at www.mhsio.on.ca, www.dart.on.ca and www.opgh.on.ca, respectively. Both the MOHLTC and the Auditor General (2008) acknowledged the importance of service providers enhancing services that will encourage people to seek necessary treatment.

Leveraging Technology to Maintain and Expand the e-Network Solution

ConnexOntario's vision statement reads: *"In the addiction, gambling, and mental health systems we are the benchmark of 24/7 access to quality information through professional staff and state-of-the-art technology."*

ConnexOntario is committed to being creative and innovative in its service delivery. By leveraging relevant and current technology, ConnexOntario takes advantage of the depth of the Registry information in a number of ways:

Information and Referral

ConnexOntario's Information and Referral Specialists use a computerized resource matching and referral algorithm to search the database when responding to the provincial, confidential and anonymous, toll-free telephone line calls and webchats. **Scenario:** A 21-year-old female college student in London, Ontario, who had a previous diagnosis of bipolar disorder, recently discussed a dependency on alcohol with her family physician. They agreed that she requires the services of a program specializing in concurrent mental health and substance use disorders. She calls/webchats with a ConnexOntario IRS who, after hearing her situation, initiates a search of the database for suitable treatment options that may be available to her. Due to the depth of information available in the database per service, specific search results matching numerous salient caller characteristics are returned.

An important consequence of working within a relatively

narrow scope and great depth of information is that ConnexOntario IRS have expert knowledge on navigating the addiction and mental health system in the province of Ontario. IRS spends time educating callers on the different types of services available to them and the specific access requirements of the service that they may be interested in. This type of front-line expertise and assistance in system navigation may not be available from the more generic and non-specialized information and referral services that have a mandate that includes a wide variety and limited depth of human services information on topics such as social services, employment services, financial assistance services and government services.

Online Searchable Service Inventories

ConnexOntario provides four public websites – www.connexontario.ca, www.dart.on.ca, www.mhsio.on.ca and www.opgh.on.ca – with the latter three offering online, searchable inventories of services for members of the public and professionals. Search results provide a subset of the database information. **Scenario:** A staff member at an assessment and referral service has just completed an assessment of an individual. They have determined that the individual should contact a local organization that offers day/evening services. The ConnexOntario online directory is used to locate the information about the services, including a map of the location and necessary contact information. The page is then printed for the individual, who can take it with them to call for an appointment.

ConnexOntario eServices

ConnexOntario eServices allows participating organizations and key stakeholders to access the database information in detail and update requisite information online. **Scenario:** A case manager is working with an individual, who requires immediate supportive housing services. After logging into eServices and reviewing the availability dashboard, it is determined that a number of services may meet the needs of the individual in terms of how soon they may be available. A review of the detailed information available through eServices about each program helps to narrow down the program suitability. The eServices mapping function provides insight into the travel distance that would be required.

Information Requests

ConnexOntario responds to adhoc requests for information and contributes data to the development of policy and strategic planning concerning mental health and addiction treatment on a provincial, and/or LHIN basis. **Scenario One:** A local planning group has just met with a LHIN representative. It was determined that they require a map with all the mental health and addiction service sites in the specific LHIN plotted on it. They also require information on the average wait for services for each of the services offered in the LHIN, compared to the

average wait for similar types of services in each of the other 13 LHINs in the province. A request is made and ConnexOntario provides the planning group with the necessary map and average wait information.

Scenario Two: A MOHLTC/LHIN staffer is asked to provide a briefing note on the number and availability of residential treatment beds for youth. This information is for the Ontario Minister of Health and Long-Term Care who will be using it at the upcoming legislative session to be held within the hour. A request for information is made to ConnexOntario by the MOHLTC/LHIN staffer.

ConnexOntario generated the report and the information is delivered to the Minister within the allotted time frame.

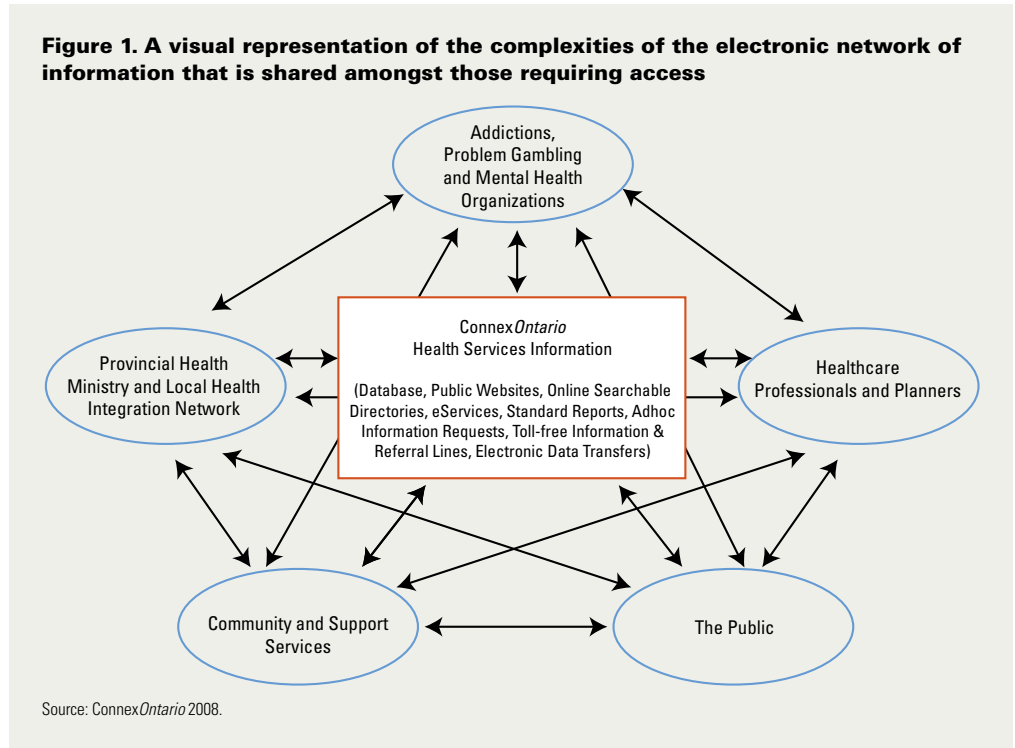
Authoritative Source of Information

ConnexOntario acts as the authoritative source concerning Ontario MOHLTC-funded mental health and addictions service information. Data from the ConnexOntario database are shared electronically with other organizations for use in their own databases (i.e., Community Care Access Centre [CCAC], Canadian Centre on Substance Abuse [CCSA], etc.) **Scenario:** A collateral healthcare organization has a valid use for information about the services offered by the mental health and addictions organizations in Ontario, funded by the MOHLTC. To ease the administrative burden placed on all of the organizations involved in obtaining this information, ConnexOntario – as the authoritative source – provides an automated, electronic transfer of the required data points to the collateral organization.

Information Management and Standardization to Support the e-Network Solution

ConnexOntario supports a systems approach established through the MOHLTC by contributing to the development of a common language by which addictions treatment and mental health services can be discussed, presented, inventoried and analyzed. Service and program information is organized in the ConnexOntario database according to MOHLTC-

Figure 1. A visual representation of the complexities of the electronic network of information that is shared amongst those requiring access



Source: ConnexOntario 2008.

approved Provincial Service Categories for the addictions and problem gambling services. Standardized MOHLTC-defined Management Information System (MIS) service definitions and the Mental Health Common Data Set (MH-CDS) are used in the mental health sector. ConnexOntario ensures reporting of comparable data to ConnexOntario, the Drug and Alcohol Treatment Information System (DATIS), and MIS by reconciling information with MIS and with DATIS on an ongoing basis. DATIS, which provides client-level data on client characteristics and services used, together with DART data, provides powerful planning information at both the program and client levels. The Auditor General (2008) references the potential of the three information systems to provide the LHINs and the MOHLTC with excellent information for planning.

ConnexOntario Then and Now

The rationale that informed the development of ConnexOntario remains valid today. David Caplan, the former Ontario Minister of Health and Long-Term Care, released a discussion paper entitled “Every Door is the Right Door” at the *Open Minds. Healthy Minds*. Mental Health and Addictions Strategy Summit held in July 2009. In the discussion paper, ConnexOntario was highlighted as an example of an MOHLTC-funded organization that offers services to help people connect quickly with care via appropriate referrals.

ConnexOntario continues to be a part of the OHIP out-of-

Table 1. ConnexOntario: 1991 compared to 2009

		1991	2009
Operational Information	Organizational Structure	Report up through to the President of CAMH	Report to the Board of Directors
	Staffing	8.5 FTE	30.5 FTE plus 15 relief staff
Information Management	Availability Reporting	Voluntary	Mandated
		IVR, phone, fax	Online via eServices, phone, fax
	Descriptive Program Information	Voluntary	Mandated
		Mail, phone, fax	Online via eServices, mail, phone, fax
	Database Structure	Agency, service, activity	Organization, site, program
	Organizations and Programs	240 agencies	439 organizations and approximately 3,000 services available for referral purposes
Database Tables	Less than 100	Over 200	
Technology	Desktop Computers	Nine desktops 80386 25 MHz processors 40 MB hard drives SVGA colour monitors	40 desktops Intel Duo Quad Core 3 GHz processor 4 GB RAM 1 iMac and 2 PowerMacs
	Web Server	None	Sun Dual Sparc 3 GHz processors 4 GB RAM Solaris 9 (Unix) OS Oracle Enterprise 10g Release 3 Internet Application server
	File Server	None	HP360 Dual Xeon 3 GHz processor 8 GB RAM
	Database Server	80486 33 MHz processor Mirrored 668 MB hard drives	Sun Microsystems database server – Dual Sparc 3 GHz processors 4 GB RAM Solaris 9 (UNIX) operating system
	Network Platform	Novell NetWare ver. 3.11	Windows server 2003
	Remote/Internet Connectivity	2400 baud modem	10 MB fibre optic cable
	Database	Oracle 6	Oracle 10 Release 3 Standard Edition One database system

country prior approval process, expanding this role to include information about mental health services. ConnexOntario continues its mission to: *“Improve access to addiction, gambling, and mental health services for the people of Ontario, by providing quality service system information; and, to support the development of an efficient, accountable system by providing planning information to system managers and stewards.”* Although the basic foundation and principles informing the ConnexOntario services have

remained the same, Table 1 shows the significant enhancement and growth that have happened over 18 years of operation.

Challenges and Lessons Learned

Since the inception of ConnexOntario in 1991, there has been one challenge that has remained constant – the ability and/or willingness of organizations to provide updates on the availability of their services.

Early on, it was evident that many organizations did not feel that they would be able to provide availability updates as frequently as *ConnexOntario* was requesting or, in some cases, they did not believe there was value in providing availability updates at all. Reasons that were given then (Rush et al. 1993), and that are often given today, included: the program is always full and does not need referrals from *ConnexOntario*; the program has a restricted catchment area (i.e., county, municipality, etc.); the program has a restricted target group; the program availability could change depending on the seriousness of the case in question; and the cycle length and cycle type would affect the frequency of availability and availability reporting. In some cases, even if a program is available immediately, it may only be available to individuals that meet a specific set of criteria (e.g., an assessment has been done).

To address these issues, *ConnexOntario* Data and Information Specialists (DIS) work with the organization to determine the most appropriate reporting frequency for the program in question. Recommended reporting frequencies for specific types of services (e.g., case management, residential) have been identified as a guideline. Various methods for reporting availability have also been introduced over the years.

The IVR, originally used in 1991, has been replaced with e-mail, toll-free telephone and an online availability updating mechanism through *ConnexOntario* eServices. The Auditor General (2008) highlighted, with great emphasis, the significance of accurate and up-to-date availability reporting by addictions and mental health services to *ConnexOntario*. Reporting of all descriptive and availability data to *ConnexOntario* has become a requirement of funding, and is documented in each organization's Multi-sector Service Accountability Agreement (MSAA) with their LHIN.

ConnexOntario supports the LHINs, the MOHLTC and other key stakeholders by providing the informatics expertise required to create and maintain inventories of health services by using innovative technological solutions that take into account the way people from various social and professional settings create, use and find information. Designing and developing such state-of-the-art technology is not an easy task. However, it is the acquisition and maintenance of high quality data that is the real challenge for all information systems. Vigilance with regard to the accuracy and currency of the data is required. To that end, *ConnexOntario* ensures that appropriate DIS staffing levels are in place to manage the requirements of sustaining a complex provincial database. Cost effectiveness and operational efficiencies can be found in supplying adequate resources to implement essential processes and procedures vital to maintaining useful and valued data. DIS staff members develop close working relationships with the participating organizations in order to assist the organizations in understanding their data reporting requirements to *ConnexOntario*.

A Look into the Future

There are a number of e-Health initiatives under development within the Ontario MOHLTC, the LHIN, and the private sector that complement *ConnexOntario*'s existing services. The Community Care Information Management (CCIM) division of the MOHLTC is piloting a common mental health assessment tool called the Ontario Common Assessment of Need (OCAN). Existing *ConnexOntario* web interfaces and the resource matching and referral algorithms currently used by *ConnexOntario* could be adjusted – relatively easily – to accommodate and interface with the OCAN data points required to match the type of resources determined as a result of the assessment. Organizations and professionals, while administering the OCAN, could generate an immediate list of potential program options for their clients including the availability of the program, and a map of the service location. Additionally, further enhancements to the *ConnexOntario* system could allow for an e-referral to the program, or booking the client directly into an appointment for service. In 2006, the Vancouver Island Health Authority (VIHA) announced that, with the help of \$1.8 million in funding from Canada Health Infoway, and in conjunction with two for-profit technology firms, they would begin developing standardized electronic mental health and addictions assessment forms and decision support tools for use by clinicians. The electronic assessment tools – like Ontario's OCAN – would be electronically linked to a real-time inventory of services – like *ConnexOntario*'s inventory of mental health and addictions services. A study by Carise et al. (2002) reported that professionals trained in using an electronic directory of resources for referral purposes developed better treatment plans.

Involvement with electronic wait-list management is another natural enhancement of *ConnexOntario* services. A centrally managed, electronic wait-list could automatically monitor the *ConnexOntario* database for the availability of resources matching the profile of clients on a wait-list. Further automation could be developed to include automated e-referrals to services as they become available.

Other enhancements currently under consideration include developing a mobile version of *ConnexOntario* eServices, an RSS feed providing instant notification of bed/appointment/caseload availability, and the ability to provide information and referral support via text messaging.

Additionally, discussions are underway to expand the *ConnexOntario* inventory of services to include a broader range of MOHLTC/LHIN-funded health services, allowing for easier and more transparent access to services, for members of the public and for professionals developing treatment plans. Carise et al. (2002) also reported that the use of an electronic inventory of various health services allowed substance abuse professionals to widen the scope of the treatment strategy, developing more comprehensive treatment plans that addressed issues related

to substance abuse issues, as well as other health and social problems.

Conclusion

ConnexOntario Health Services Information began offering electronic health services nearly 20 years ago and has grown significantly since then, developing its expertise in information management, and expanding the breadth of the network by using the information housed in the centralized database. The services offered by ConnexOntario are considered a valuable resource of the mental health and addictions system in Ontario. This was emphasized by Ron Sapsford, Ontario's Deputy Minister of Health and Long-Term Care, during a debate in the Legislative Assembly of Ontario about the Auditor General's Report (2008) on the Ministry of Health and Long-Term Care (Legislative Assembly 2009).

It would be of great value to the Ontario MOHLTC, LHIN, and Ontario e-Health to further collaborate with the well established and proven e-network solution for mental health and addictions information management offered by ConnexOntario. Future partnerships with other provincial databases, information system, and electronic networks should serve to enhance the experience of members of the general public while navigating the health system for services. Provincial information systems should work together and strive to be useful tools to the health service providers required to participate in them. **EH**

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