






Mental Health
Commission
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Commission de
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du Canada

Value and efficacy: Expanding access to counselling, psychotherapies and psychological services

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The Evidence-Base for Psychotherapy

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Goals for Today

- To evaluate the evidence base for psychotherapies and evidence-based practices in psychotherapy
- To critically evaluate the relative efficacy of medications versus psychotherapy for depressive disorders.
- To evaluate the merits of common factors in predicting psychotherapy outcomes

Definition of Psychotherapy

- The informed and intentional application of clinical methods and interpersonal stances
- Derived from established psychological principles
- For the purpose of assisting people to modify their behaviors, cognitions, emotions, and/or other personal characteristics

Psychotherapy Research

DEFINITIONS

Empirically Supported Treatments

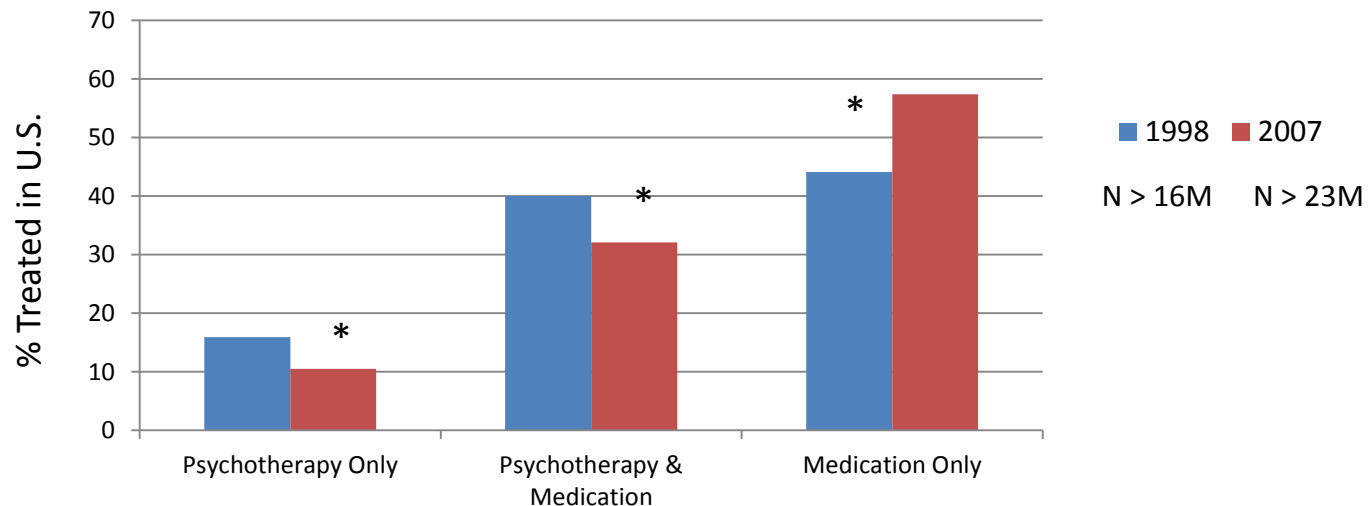
- List of empirically supported treatments by Division of Clinical Psychology, APA
 - First published list: Chambless & Hollon (1998)
 - <https://www.div12.org/psychological-treatments/>
- Criteria
 - Two RCTs from different locations or research teams
 - Treatment manuals, assessed treatment fidelity
 - Clearly defined sample and disorder
 - Clearly superior to a placebo/control or to another bona fide treatment

Evidence-Based Practice in Psychotherapy (APA, 2006)

- Integration of:
 - Best available research, with
 - Clinical expertise, in the context of
 - Patient characteristics, culture and preferences
 - <http://www.apa.org/pubs/journals/features/evidence-based-statement.pdf>

Psychotherapy Use

- Over 1 million Canadians use psychotherapy in a given year (Cox, 2014; Vasiliadis et al., 2009)
 - > 5% used outpatient services for mental health beyond family practitioner
- Rates of psychotherapy use has been stable or declined in the past decade (Olfson & Marcus, 2010)



Efficacy of Psychotherapy

- Is psychotherapy more effective than no treatment?
- Mega-analyses (meta-analyses of meta-analyses) (Lambert & Bergin, 1994; Grissom, 1996)
 - Reviewed 25 and 68 MA studies respectively looking at psychotherapy vs no-treatment.
 - Average effect size of $d=.80$: a “large” effect (Wampold & Imel, 2015)
 - i.e., average patient is better off than 79% of untreated controls
 - 69% success rate due to psychotherapy
 - 14% of the outcome variance accounted for
- Effects sizes are as large as or larger than many common medical procedures (Rosnow & Rosenthal, 2003; Wampold et al., 2005; 2007)
 - E.g., interventions in cardiology (e.g. statins), geriatric medicine, asthma, aspirin as a prophylaxis for heart attack, warfarin for blood clots, AZT for neonatal HIV infection, influenza vaccine, cataract surgery....

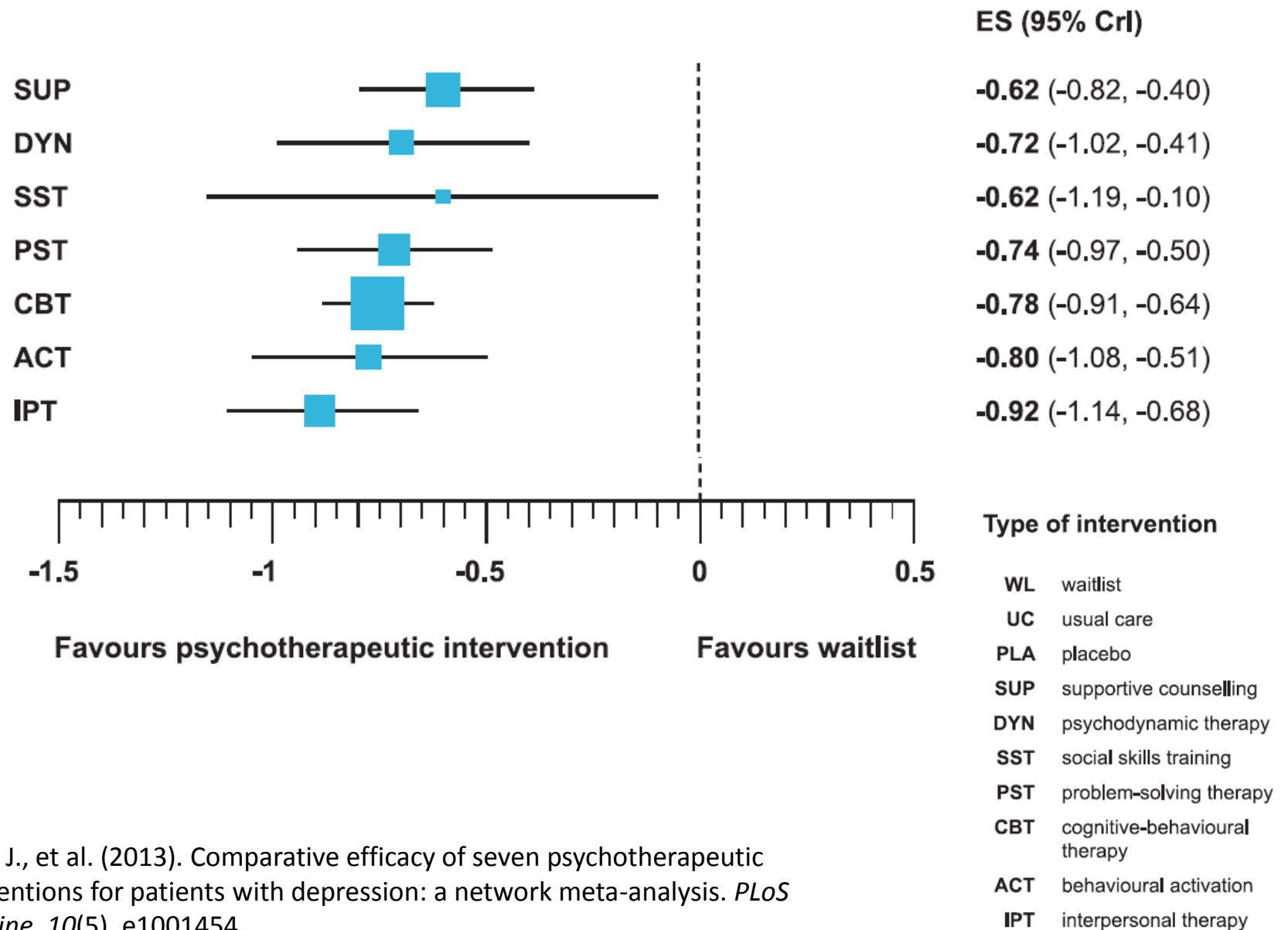
Types of Psychotherapy

- Interpersonal Psychotherapy (IPT):
 - a brief structured therapy that focuses on interpersonal issues in depression
- Behavioral Activation (BA):
 - raises the patient's awareness of pleasant activities and seeks to increase the patient's positive interactions with the environment;
- Cognitive Behavioral Therapy (CBT):
 - focuses on a patient's negative beliefs, how they affect current and future behavior, and restructures the beliefs;
- Psychodynamic Therapy (PDT):
 - focuses on unresolved conflicts and relationships and the impact they have on a patient's current functioning;

Relative Efficacy of Psychotherapy Approaches

- Are there differences in outcomes between treatment types?
- Mega-analyses of 32 meta-analyses of bona fide treatments (Wampold et al., 1997; 2002; Wampold & Imel, 2015).
 - Differences between therapies yielded an effect size of $d = .20$
 - a “small” effect accounting for 1% of the variance in the outcome.
 - Results are consistent for anxiety and depression (Wampold et al., 2007; 2008; Wampold & Imel, 2015)
- When researcher allegiance is taken into account, the relative efficacy was negligible: $d = 0$ to $.17$ (Lambert & Ogles, 2004; Wampold, 2001).
- Drop out rates are equivalent across treatments (Swift & Greenberg, 2012)
 - 19% in clinical trials, 38% in community practices

Forest Plot



Barth, J., et al. (2013). Comparative efficacy of seven psychotherapeutic interventions for patients with depression: a network meta-analysis. *PLoS medicine*, 10(5), e1001454.

Psychotherapy and Antidepressant Medications

- Both psychotherapy and SSRIs are more effective than placebo (de Rubeis et al., 2005)
- Psychotherapy and SSRIs do not differ in effectiveness when bona fide psychotherapies are tested (Spielmans et al., 2011):
 - Chronic vs non-chronic depression (de Maat et al., 2006)
 - Severity of depression (de Cuijpers et al., 2008; Maat et al., 2006)
 - Some evidence for superiority of SSRIs for dysthymia but effects are small (de Cuijpers et al., 2008)
- Psychotherapy has better long term outcomes at follow up (de Maat et al., 2006; Imel et al., 2008; Spielmans et al., 2011)
 - Drop out rates lower for psychotherapy (de Cuijpers et al., 2008)
 - Psychotherapies create less resistance to multiple administrations (Wampold, 2011).
- 75% of Patients prefer psychotherapy to medications for depression (Swift et al., 2013)
 - Client preference is significantly related to outcomes (Swift et al., 2011)
 - Most clients receive medications (Olfson & Marcus, 2010).

“Psychotherapy and Medications are Equally Effective” - Revisited

Publication Bias

- Tendency to publish only significant findings
- Suppression of data by industry or researchers
- Effects of antidepressant medications are likely over estimated (Turner et al., 2008)

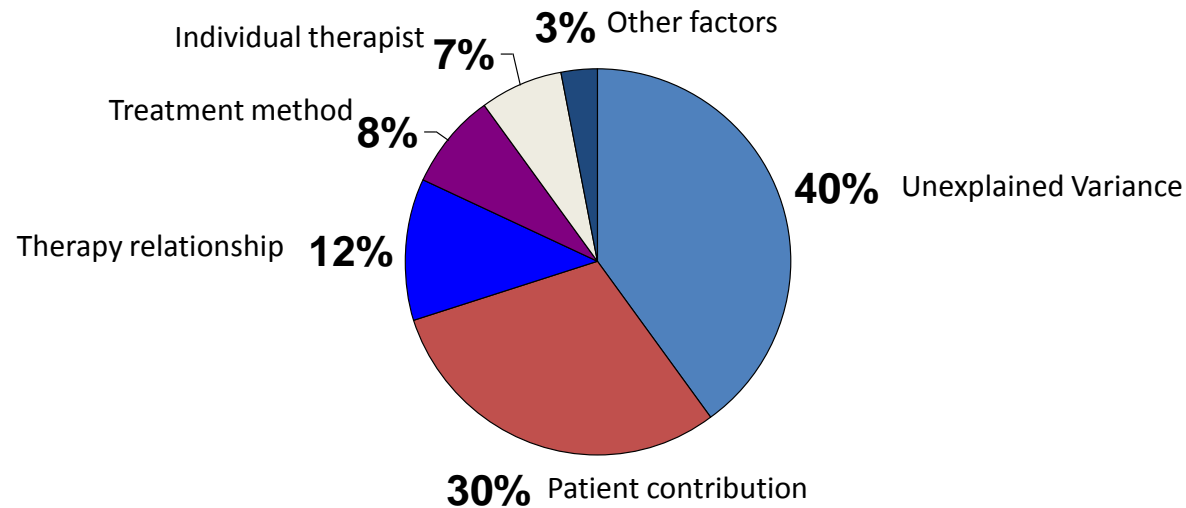
“Psychotherapy and Medications are Equally Effective” - Revisited

- 31% of 74 FDA registered trials between 1987-2004 were never published ($n = 23$)
 - Positive trials 12x more likely to be published (Turner, 2008).
- Effect size of medication:
 - Published trials: $d = 0.37$
 - Unpublished trials: $d = 0.15$
 - Adjusted effect size: $d = 0.25$
- Evidence of minimal publication bias in 31 published psychotherapy trials for depression (Niemeyer et al., 2013)
 - Some evidence of publication bias in CBT trials (Cuijpers et al., 2010)
 - Publication bias in NIMH funded psychotherapy studies (Driessen et al., 2017)
 - Adjusted effect sizes for psychotherapy remain larger than adjusted effect size for medications ($d = .42$)

Common Factors

- Factors that reliably lead to positive outcomes that are:
 - 1) Inherent in any therapeutic situation, and
 - 2) Not specific to any one therapy approach.
- Relationship: alliance; client feedback.
- Patient: severity; expectation of benefit/hope (a.k.a., placebo); belief in credibility of therapy and therapist, attachment, preference.
- Therapist: allegiance to the therapeutic approach (belief in effectiveness); empathy; managing countertransference.

Common Factors



Percent of total outcome variance attributable to therapeutic factors (Norcross, 2011)

- 80% of NIH dollars for psychosocial intervention research is spent on evaluating efficacy of treatment methods (Norcross, 2012).

Evidence-Based Practices in Psychotherapy

(Norcross, 2011)

Therapeutic alliance

(Horvath et al., 2011)

$r = .27$ with outcomes

Repairing alliance ruptures

(Safran et al., 2011)

$r = .24$ with outcomes

Therapist empathy

(Elliott et al., 2011)

$r = .31$ with outcomes

Managing countertransference

(Hayes et al., 2011)

$r = .56$ with outcomes

Progress Monitoring

(Lambert & Shimokawa, 2011)

$r = .25$ with outcomes

Common Factors: Relationship

- Therapeutic alliance
 - Defined as agreement on tasks and goals of therapy, and the bond between therapist and patient (Bordin, 1967).
 - Emphasizes conscious aspects of relationship, like collaboration and consensus.
 - Meta-analysis of individual therapy with 200 studies (Horvath et al., 2011).
 - Only included studies with bona fide treatments
 - “Medium” effect of alliance to predict outcome ($d = .71$)
 - Therapeutic alliance in the early and late sessions was most related to outcomes (middle session alliance was not)
 - No differences between types of psychotherapy (IPT, CBT, STDP, etc.) on the relation between alliance and outcome.
 - Emerging evidence that recognizing and repairing alliance ruptures improves outcomes (Safran et al., 2011).

Common Factors: Patient

- Severity of problems
 - Functional impairment, severity of symptoms associated with poorer outcomes (Clarkin & Levy, 2004).
 - Comorbid personality disorder, and history of sexual abuse also associated with poorer outcome and premature termination (Clarkin & Levy, 2004).
- Expectations/Hope
 - Accounts for a small but significant ($r = .21$) amount of outcome variance (Constantino, 2011).
- Coping style
 - Match between client coping style and treatment approach related to positive outcomes with a medium effect size ($r = .56$) (Beutler et al., 2011).
 - Externalizing style with symptom-focused treatment
 - Internalizing style with insight-oriented treatment

Common Factors: Therapist

- Therapist effects
 - Differences between therapists usually account for 7% of outcome variance.
 - 11% to 38% of therapists on average had patients who ended therapy worse off than when they started (Kraus et al., 2011; N = 700 therapists and N = 7,000 patients)
 - Up to 16% of therapists were classified as reliably “harmful”
 - Frequency of effective therapists ranged from 29% to 67% depending on the disorder (Krauss et al., 2011).
- Training therapists to be adherent and competent to a manual is not significantly related to client outcomes (Webb et al., 2010).
 - Adherence ($r = .02$)
 - Competence ($r = .07$)
- Characteristics of effective therapists (Wampold et al., 2017)
 - Ability to form an alliance across a range of patients
 - Facilitative interpersonal skills (empathy, verbal/emotional fluency)
 - Professional self doubt (health skepticism about one’s abilities)
 - Deliberate practice (individualized continuous training)

Practice-Based Implications

1. Psychotherapy is effective for many mental disorders
 - a. As or more effective than anti-depressant medications
 - b. Know the research – it instills hope in patients
2. Bona-fide psychotherapies are equally effective for many disorders
 - a. Therapies with an established psychological theory of the disorder, and treatment based on the theory, delivered by a trained professional
3. Common factors account for a significant proportion of patient outcomes that exceeds the specific therapy offered
 - a. Develop an alliance early and maintain it:
 - a. Recognize and repair an alliance rupture – do not ignore it (Safran et al., 2011)
 - b. Alliance growth over time is potentially therapeutic in and of itself (Zilcha-Mano, 2017)
 - b. Therapists engage in deliberate practice:
 - a. Seek the patient's perspective on therapist empathy
 - b. Be aware of very negative effects of therapist: hostility, confrontations, treatment rigidity (countertransference).
 - c. Systematically collect session to session patient outcomes and use this information to adjust treatment.
 - c. Patient factors such as severity, comorbidity, coping style.
 - a. Assess for these and adjust therapy accordingly



- A collaboration between UofT Psychiatry and uOttawa Psychology to conduct practice-based research in psychotherapy
- Recently received a CIHR operating grant to train community-based therapists to identify and repair alliance ruptures
- Free monthly E-Newsletter that summarizes the best psychotherapy research for clinicians
- Free to join: www.pprnet.ca.

Insuring Psychological Services as part of Medicare is Cost-Effective for Depression in Canada

MHCC WEBINAR

September 26, 2017

Expanding Access to Counselling, Psychotherapies and Psychological Services: Value and Efficacy Confirmation

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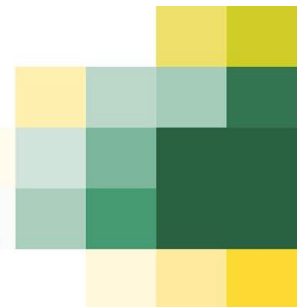
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Advisory Committee

- Mental Health Commission of Canada
- Quebec Ministry of Health and Social Services
- Canadian Psychological Association
- Order (College) of Psychologists of Quebec (OPQ) and Ontario
- Community organizations – REVIVRE
- Institute of Health Economics

Citation:

Vasiliadis HM, Dezetter A, Latimer E, Drapeau M, Lesage A. Assessing the Costs and Benefits of Insuring Psychological Services as Part of Medicare for Depression in Canada. *Psychiatr Serv.* 2017;68(9):899-906.

Rationale

- The prevalence of depression is comparable to that of other common chronic diseases like hypertension and diabetes: lifetime rates in Canada reach up to 11.3%. *CCHS on MH 2012*
- The disability related to depression is ranked as one of the highest among all diseases. *WHO, 2012*
- The attributable costs associated with depression have increased in North America to reach \$210 billion in 2010. *Greenberg et al., 2015*
- Close to 50% do not use health services for their depression. *CCHS, 2002; 2012*
- Modern psychological therapies can cost-effectively supplement or replace pharmacological approaches to treat depression. *Myhr et al., 2006; Wells et al., 2007; CANMAT, 1999*

Context

- Among Canadians consulting for mental health reasons, close to 80% consult their family physician. Vasiliadis et al., 2005
- The majority of family physicians, the gatekeepers of the health system, are aware of evidence-based psychological therapies but are not trained to offer them, don't have time, or do not wish to offer them. Grenier et al., 2008
 - The largest barrier noted from family physicians for not referring patients who needed psychological services is the lack of public health insurance coverage.
 - As a result, access to service providers of psychotherapy in Canada is both limited and inequitable.

Population based studies

- The Joint Canada US Health Survey (2004), highlighted disparities in treatment-seeking among depressed populations associated with medical insurance in the United States. Vasiliadis et al., 2007
- CCHS-MHWP (2002) showed that income and education were barriers to consulting psychologists and other health providers. Vasiliadis et al., 2009
- Recent data from the CCHS-MH (2012) showed that Sunderland & Findlay, 2013:
 - 39% of adults with major depression had reported an unmet mental health care need
 - Of which 71% had reported a need for counseling/psychotherapy.

No insurance, no accessibility

A report carried out by Quebec's Health Commissioner on the performance of the health system clearly highlighted inequity in access to effective mental health services such as psychotherapy and the need to re-evaluate resource allocation. In other words:



WHAT IS NOT INSURED IS NOT ACCESSIBLE TO ALL

Commissaire à la santé et au bien-être. La Performance du Système de Santé et de Services Sociaux Québécois. 2013. ISBN : 978-2-550-67100-8

International Studies: UK, Australia and France

- So far, the UK and Australia have decided to reimburse psychological therapies in their health systems.
- In the UK, Layard et al.'s (2007) cost-benefit analysis of the program “Improving Access to Psychological Therapies (IAPT)” showed that the program would pay for itself within a period of five years.
- In France, a similar study estimated a cost-benefit ratio ranging between 1.14 and 1.95. Dezetter et al., 2013

Objectives

- The objective of this study was therefore to evaluate the cost-effectiveness associated with rendering psychological services as part of Medicare for individuals with unmet mental health needs.
- This evaluation will provide health system policy informations to help decision makers allocate more optimally resources for a more efficient public managed healthcare system.

Methods

- Using discrete event simulation, we modelled the evolution of depression over a 40 year period to assess the cost-effectiveness of increasing publicly funded access to psychological services in Canada as compared to the status quo.
- We included in the model incident cases of depression (2.9% of the population) aged between 20 and 85 years.
- The probability of events and model parameters were based on:
 - epidemiologic, pharmacologic, cost (direct and indirect)
 - and utility data from the literature as well as secondary data analyses of the 2012 CCHS-MH survey carried out by Statistics Canada.

Model overview

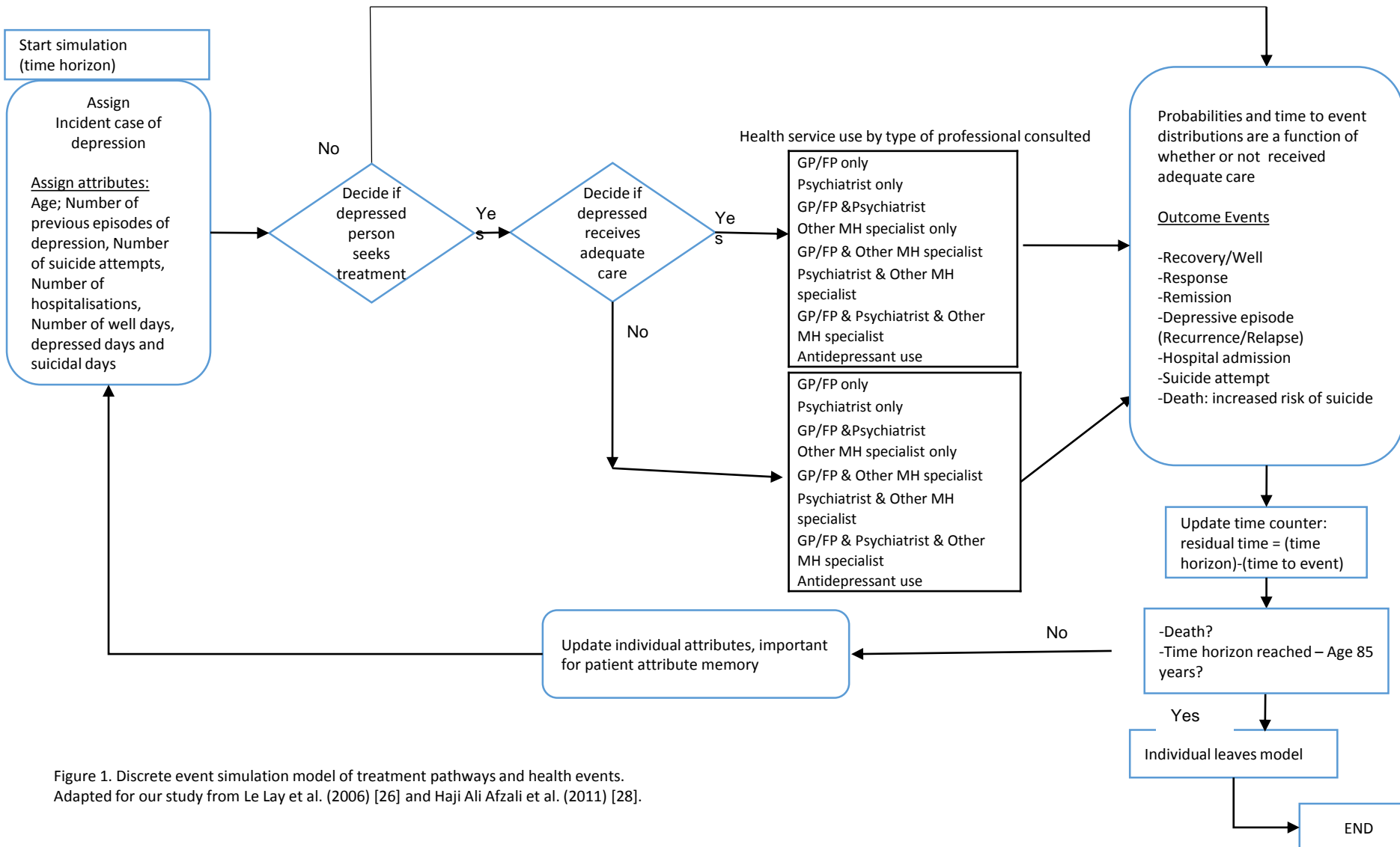


Figure 1. Discrete event simulation model of treatment pathways and health events.
Adapted for our study from Le Lay et al. (2006) [26] and Haji Ali Afzali et al. (2011) [28].

RESULTS

Table 3. Characteristics of a simulated adult population with incident depression over 40 year follow-up.

	Base case scenario: STATUS QUO	Alternate scenario: Increased access to psychological services
	Average (95%CI) [Per person, over 40 years]	
Number of days depressed	760 (740 - 780)	706 (687 - 725)
Number of days depressed of non-users of mental health services	91(90 - 92)	81 (80 - 82)
Number of days being chronically depressed	173 (169 - 177)	157 (153 - 160)
Number of days of being suicidal	65 (63 - 67)	60 (58 - 62)
Number of days of well state	12 355 (12 307 – 12 403)	12 476 (12 428 -12524)
Number of days of well state for non users	140 (138 - 142)	126 (124- 128)
Prevalence hospitalisation for mental health reasons - lifetime	30.2% (29.8% - 30.5%)	27.9% (27.6% - 28.2%)
Prevalence of attempted suicide - lifetime	14.6% (14.3% - 14.9%)	14.1% (13.8% - 14.4%)
Number of suicides	250	184

Table 4. Cost-effectiveness of increased access to psychological services versus status quo

	STATUS QUO	Increased access to psychological services	Absolute Difference	ICER
	Average (95% CI)			
Total QALYs	30.10 (29.99 - 30.21)	30.27 (30.16 – 30.38)	0.17	
Average health system costs	\$114,123	\$112,519	-\$1,604	‘dominant’
Average societal costs with friction cost method	\$118,021	\$ 116,117	-\$1,904	‘dominant’
Average societal costs with human capital approach	\$120,629	\$ 118,039	-\$2,590	‘dominant’
Sensitivity analyses				
Total QALYs, less pessimistic ^a	30.74 (30.64 – 30.84)	30.86 (30.76 – 30.96)	0.18	
Total QALYs, psychotherapy up to 25% less effective than previous estimates ^b	30.10 (29.99 – 30.21)	30.27 (30.16 – 30.37)	0.17	
Lower limit estimates				
Average health system costs	\$84,370	\$83,688 ^d	-\$702	‘dominant’
Average societal costs with friction cost method	\$85,354	\$84,576 ^d	-\$778	‘dominant’
Average societal costs with human capital approach	\$87,213	\$85,947 ^d	-\$1,266	‘dominant’
Higher limit estimates ^c				
Average health system costs	\$164,088	\$161,018	-\$3,070	‘dominant’
Average societal costs with friction cost method	\$197,484	\$191,861	-\$5,623	‘dominant’
Average societal costs with human capital approach	\$200,138	\$193,818	-\$6,320	‘dominant’

^aLess pessimistic: utility for well state = 0.85 and utility of days depressed = 0.58, irrespective of health service use

^b A recent study reporting that talk therapy may be up to 25% less effective [72]

^cFor individuals receiving care from all three type of professionals, GP/FP, psychiatrist, other MH specialist, all costs related to visits to other MH specialists will be incurred by the health system.

^dFor new individuals accessing publicly funded psychological therapies : number of annual visits is 4 with/without 2 GP visits.

Increasing access:

- Rendering psychological services publicly funded for adults with depression reporting an unmet mental health need translates into an average CDN \$123,212,872 (\$67,709,860 to \$190,922,732) in additional costs.
 - [\$1,292 (2 GP/FP visits + 8 psychotherapy sessions within a year) per individual * n = 95,366 individuals with unmet needs]
- The savings to society using the human capital approach would reach on an average of CDN \$246,997,940 (\$120,733,356 to \$602,713,120).

DISCUSSION- In light of literature

- If one were to consider covering psychotherapy sessions for all Canadian adults with incident depression (2.9%), the program costs would reach \$1.008 billion.
- In Australia, in the first 3 years of the *Better Access Program*, close to 2,017,000 individuals received approximately \$11.1 millions (6 sessions per individual) psychotherapy sessions for a total budget of CDN \$2.80 billion or \$1,514 per individual.^{Pirkis et al., 2015}
- In the UK, the cost of the IAPT program was estimated at £600 million to treat 800,000 patients opting for psychological therapy in 2006.^{Layard et al., 2006}
 - Recently, the NHS invested an additional £400 million in the IAPT program to offer services to children, adolescents, older adults and people with severe mental health and chronic physical problems.^{Thornicroft, 2011}
- In France, the yearly cost of covering 12 psychological sessions for depression and anxiety disorders reached CDN \$729 million, for close to 2.3% of the population.^{Dezetter et al., 2013}
 - This estimate is lower than the one we observed: a psychotherapy session in France costs 41€ (CDN\$65) as opposed to an average of CDN \$145 in Canada.

Implications of covering psychological services as part of Medicare in a public managed healthcare system

In Australia, great concern surrounding the increasing costs of the *Better Access Program* arose, with many arguing that the program was widening the socio-economic gap in mental health service use. ^{Allen, 2011}

Harris et al., (2011) showed:

- that 90% of Better Access users had a 12-month ICD-10 mental disorder;
- those without an affective or anxiety disorder using services were not from higher socio-economic groups;
- and those with a mental disorder received significantly more services than those without.

Implications of covering psychological services as part of Medicare in a public managed healthcare system

Finally, a successful health policy, aimed at improving access to mental health services, that is relevant to a public managed healthcare system, should consider the following (Richards and Bower, 2011):

- Access: Who will get treatment?;
- Equity, type of service offered, cost-effectiveness: Are health outcomes improved at a sustainable cost?
- Patient-centered care: Is the service meeting individual mental health needs?

LIMITATIONS

- The unit cost analyses were based on national data and from the province of Quebec which may limit the generalizability to other countries with publicly funded healthcare systems like Canada.
- We assumed that 8 psychotherapy sessions and 2 physician visits would on average be covered in the increased access to psychological services scenario. Previous publications in Australia have reported that the majority of people use 6 sessions.
 - The sensitivity analyses however did not show significant difference with covering up to 12 psychotherapy sessions.
- Human capital approach was used versus the friction cost method.
- Not everyone with a mental health need would avail themselves to the services and therefore the total costs associated with increased access may have been overestimated.
- The model did not consider the effect of increasing access to psychological services for children and adolescents with mental health problems.
 - the results presented may underestimate the potential benefits and costs saved to society for this population.

CONCLUSION

“Covering psychological services as part of Medicare for individuals with major depression not receiving adequate mental healthcare would pay for itself.”

- **Canada** : every \$1 invested in the program would yield on a average of \$2.00 (\$1.78 to \$3.15) in savings to society.
- **UK** : IAPT program showed a return on investment reaching £1.75 for every £1 in health expenditures. (Layard et al., 2006)
- **France** : spending €1 in psychological services for people with depression yielded savings of € 1.95 (1.30-2.60) (Dezetter et al., 2013)

To put the results of this study into perspective for decision makers:

Public expenditures for mental health and addictions account for only 7.2% of the total national public health budget reaching \$184 per capita. An additional \$3.42 per capita investment in mental health expenditure, representing 0.13% of total health care budget, would lead to a more equitable healthcare system meeting the unmet mental health needs of the Canadian population.

Parameter estimates and
cost and utility estimates used in model

Table 1 a. Parameter estimates: Prevalence estimates of health service use and number of visits (weighted) for mental health reasons among individuals with MDE – from analysis of CCHS-MH data and published literature

Variable	Population prevalence	Visits ; Mean; Median		
Past year health service use for MH reasons: Users	64.3 %			
Past year hospitalisation for MH reasons	29.9%	2; 1 LOS : 4 days		
Past year consultation due to suicidal ideation/attempt	81%			
Status Quo: Type of service use among individuals with MDE receiving adequate care (67.4%) among users (64.3%)				
				Antidepressant use
GP/FP only	21.8 %	23, 5		81.4%
Psychiatrist only	7.2%	60, 20		
GP/FP and psychiatrist	7.8%	11,5; 41, 8		
Other MH specialist only	7.6%	53, 52		47.9%
GP/FP and Other MH specialist	25.4%	15, 4; 29, 10		90.0%
Psychiatrist and Other MH specialist	5.1%	19, 6; 22, 11		
GP/FP and Psychiatrist and Other MH specialist	25.1%	9, 4; 15, 4; 17, 9		95.3%
Status Quo: Type of service use among individuals with MDE NOT receiving adequate care (32.6%) among users (64.3%)				
GP/FP only	38%	4, 2		74.2%
Psychiatrist only	3.9%	2, 0		
GP/FP and psychiatrist	32.3%	2, 2; 3, 3		
Other MH specialist only	5.7%	3, 2		5.7%
GP/FP and Other MH specialist	14.8%	3, 3		18.9%
Psychiatrist and Other MH specialist	-	-		
GP/FP and Psychiatrist and Other MH specialist	4.1%	2, 2; 3, 3		
Comparator: Increased access to psychological services – publicly funded – for MDE with unmet need				
Past year health service use for MH reasons	68.8%			
Adequate care among users	74.8%			
New users with unmet mental health need receiving adequate care	8.1%			

Variable	Base Case Values	Source or reference
Health states / Events		
Incidence of major depression	2.9%	[40]
Persistent MDE into following year	20%	[41]
Past year attempted suicide among MDE not using or receiving adequate mental health care	9.13% (8.76% – 8.98%)	[42]
Past year attempted suicide among MDE receiving adequate mental health care	6.80% (6.74% – 6.92%)	[42]
Risk of repeat suicide attempt following attempt Median estimates	Year 1 = 16% Year1 to 4 =21%; Year >4 = 23%	[43,44]
Risk of Suicide following attempt Median estimates	Year 1 = 1.8% ;	[45-47]
TREATED Major Depression		
Time to 2 nd , 3 rd MDE Episode (i.e. time to relapse)	132 weeks	[48,49]
Length of 1 st MDE Episode	21 weeks	
Length of 2 nd MDE Episode	20 weeks	
Length of 3 rd MDE Episode	19 weeks	
Length of 4 th MDE Episode	21 weeks	
Length of 5 th MDE Episode	20 weeks	
Probability of persistent MDE Episode in 2 nd year	62%	
Probability of persistent MDE Episode in 3 rd year	73%	
Probability of persistent MDE Episode in 4 th year	84%	
Untreated Major Depression		
Time to 2 nd , 3 rd MDE Episode (i.e. time to relapse)	48 weeks	[48,49]
Length of 2 nd MDE Episode untreated	17 weeks	[48-51]
Length of 3 rd MDE Episode untreated	29 weeks	
Length of 4 th MDE Episode untreated	31 weeks	
Length of 5 th - 9 th episode MDE Episode untreated	22 weeks	
Probability of 2 nd MDE Episode untreated	0.5	[52]
Probability of 3 rd MDE Episode untreated	0.7	
Probability of 4 th and 5 th MDE Episode untreated	0.9	
Adequate treatment Recovery (one lifetime episode) within year		
GP/FP only, psychiatrist only, GP/FP and psychiatrist, antidepressant	63%	[53-55]
Other MH specialist only	54%	[54]
GP/FP and other MH specialist; psychiatrist and other MH specialist; GP/FP and psychiatrist and other MH specialist and antidepressant	67%	[55]
Non Adequate Treatment Arm: Recovery		
Not Adequate antidepressant and health service use for mental health reasons with any physician	24% – 30%	[54]
Not Adequate health service use with other MH specialist only	25%	[54,55]
Spontaneous recovery without treatment	30%	[23]
Relapse among those presenting spontaneous recovery without treatment	44%	[23]
Length of antidepressant use	median 365 days use	[56]
Persistent antidepressant use among incident users: at 1 month, 3 months, 6 months, 1 year and 2 years (and extrapolated to 3 years)	73%, 59%, 46%, 33%, 22%	[57]

Table 2. Cost and utility estimates used in model

Utilities for events/health states ^a	Base case Value (range)	
Well/Recovery	0.85	[27]
Well/Recovery in non-health service users ^b	0.72	
Depressed among health service users (moderate depression)	0.33	[58]
Dysthymia/chronic depression (partial remission)	0.58	[27,58]
Suicidal (severe depression)	0.09	[61-62]
Depressed, non-health service users	0.30	[58-60]
Dead	0	[61]
Utility decrement associated with antidepressant use	-0.005	[27,62]
Costs (in 2013 dollars)		
Health system costs		
Annual healthcare costs: Healthy/well state (i.e. non depressed and non-suicidal)	\$2735 (\$2141, \$3497)	[63]
Per diem hospitalisation cost	\$1084	[64]
Annual healthcare costs: Depression	\$3647 (\$2854, \$4662)	[65]
Excess costs associated with antidepressant use	\$1980 (\$426, \$2232)	[32]
Annual healthcare costs: Suicidal cases	\$8303 (\$1838, \$45 188)	[66]
Healthcare costs: Attempted suicide	\$14 229 (\$2042, \$45 909)	
Healthcare and related costs: Suicide	\$26 270 (\$10 492, \$108 230)	
Indirect costs related to lost productivity		
Cost of short term disability	\$18 689 (\$16 693, \$20 685)	[67-69]
Absenteeism and presenteeism costs	\$2382 (0 - \$27 516)	[70]
Friction cost method: average replacement is 3 months (range 1 and 12 months)	\$10 163 (\$3387, \$40 653)	[66,71]
Human capital approach	\$729 314 (\$515 886, \$772 406)	

^a Utility values were all based on the EQ-5D-5L

^b Utility values associated with the well/recovery state are associated with a slightly lower utility given that relapse rates are higher in non-users

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