What Works ✓

Going digital to deliver wellbeing services to young people? Insights from *e*-tools supporting youth mental health and parenting

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Targeting programme funders and providers as well as policymakers, this *What Works* offers high-level guidance for better understanding what works – and what doesn't – in digitising services to support the wellbeing of young people.

👍 What works

- Technology offers a way of diversifying and extending delivery of mental health and parenting support services, potentially improving reach, filling gaps and providing early intervention.

- From online programmes to serious games, video teleconferencing and text counselling, digital platforms lend themselves to providing preventive and self-managed care options, with commonly cited benefits including consumer empowerment, scalability, possible efficiency gains, reduced burden and social cost, standardisation of programmes and access to usage data.

- While rapidly emerging evidence is patchy and of mixed quality, studies generally find that e-therapies can be an effective option for reducing depression and anxiety in young people, and for improving parenting and child behaviour where symptoms are mild to moderate.

- Web-based programmes can be self-guided or offered with additional support (virtual or real, from professionals, peers or administrators), and are more likely to be effective when they are structured, interactive, informed by a theory of change, and teach skills.

- Different strokes for different folks: to maximise the appeal of an intervention – particularly where intended for universal access – offer users choice to personalise their experience and to access different levels and types of support, depending on what they want or need.

- Intended users should be at the heart of design and actively involved in the process alongside subject matter experts, with 'outside champions' and influential system representatives included too.

- E-therapies may be as effective as conventional face-to-face treatments – they can be used as standalone treatments but are commonly seen as a useful gateway into, or bridge between, other services. This should be reflected in implementation processes.

About *What Works*

Superu's *What Works* series synthesises what we do and don't know about a specific social sector topic. We draw on international and New Zealand research to identify what does and doesn't work to address the topic at hand. Our aim is to inform decisions and investment in the social sector.

👎 Issues to note

- There are serious risks in the use of digital tools, especially by vulnerable people for whom it might be inappropriate and in an unguided and socially isolated environment. Attempts to regulate or benchmark the quality of openly available e-mental health tools have been fraught and are ongoing.

- Sustainability beyond pilots (and seed funding) can be a challenge, due in part to open-ended resourcing requirements (budgets, capability, infrastructure, updates) for keeping pace with technology.

🔍 Further research needed

- Further research is needed into many aspects critical to effectiveness including dosage (how much is enough for users to get and/or stay better) and the value of 'mini' rather than 'maxi' sessions; better understanding how users interact with technology to change behaviour; and measurement of actual reach.

- To help address 'science-to-service' lags and roll out piloted tools that are ready for everyday use, there are calls for more real-life feasibility and translational research, with relevant forms of acceptable evidence – learning what works from popular and innovative commercially-developed 'wellness' tools is also imperative.

Technology is pervasive and could be used to better serve young people

These days it feels like there's an app for everything and more. Not only do we have instant information at our fingertips, but we can use handheld devices to better understand ourselves and make positive personal change in our lives, from drinking to fitness to mood and beyond. Likewise, the internet offers online courses for people to gain new skills and knowledge. Social media and blogs provide opportunities for pop-up communities of support and information sharing. And while the 'digital divide' still exists in New Zealand[1], it's closing with improved access through schools, workplaces and communities, if not also in households and through individual ownership of devices[2,3].

Recognising that youth ('digi-natives') and their parents are living in this online world, Government is starting to invest in more technology-based initiatives as a modern form of service outreach.

But how confident are we that such initiatives actually work?

Given the potential value but relative immaturity and sporadic nature of public spend in digital 'solutions' to date, there's a need to raise understanding about the effectiveness, or otherwise, of digitally-delivered programmes and tools.

This resonates with The Productivity Commission's observations in *More effective social services* (2015). Noting the often essential, but under-utilised, role of information and communications technologies (ICT) in transforming service provision and client engagement, the authors recommended greater system-wide learning about effective approaches, particularly innovative social service designs[4].

Unpacking the 'promise' of technology for diversifying and extending promotion and prevention services is in sync with Government's social investment work.

Promoting healthy relationships, family life, emotional wellbeing and more, recent Crown-funded digital initiatives include:

- apps for parents (SKIP Tips, Tiny Adventures, Well Child Tamariki Ora)

- tools to break cycles of violence (isafe decision aid for women; AUT's app in development for adolescents)

- A Better Start - E Tipu e Rea (National Science Challenge) HABITS project.

Part of the solution requires better understanding the effectiveness of existing services and strengthening the evidence base of what works. Another part calls for thinking about different forms of services and delivery models, including devolved, user-centred and co-created[a] types.

Strengthening its focus on improving the lives and later outcomes of children and young people through early interventions, the Crown has identified the need to improve the reach, responsiveness and efficacy of services to better serve at-risk 0-24 year-olds.

Prompting shared thinking and conversations

This *What Works* draws out high-level findings on the most established types of digital tools for delivering wellbeing support, then digs deeper to learn about good practices from particular cases. It looks at intended users, questions of safety and support, design forms and processes, and challenges in implementation, uptake, and quality assurance. We conclude there is a lot of potential for going digital in delivering services, if done the right way.

a. See Superu's *What Works: Integrated social services for vulnerable people* (2015).

Youth mental health and parent support are critical 'problem areas' attracting early development of digital interventions

At this stage, we stand to learn most from focusing on the most established and evaluated types of digital tools – those developed for youth which are largely concentrated on improving mental health. Online training for parents in managing child behaviour is an area of growth which may offer further learnings. Taken together, these can be thought of as strands of wellbeing support services that promote emotional, psychological and social wellbeing[b]. From a systems as well as a human (families and whānau) perspective, mental health and parenting support are two critical 'problem' areas needing early intervention.

We know that adolescents are particularly vulnerable to developing mental health concerns, with approximately 20-25% of New Zealand teenagers reportedly experiencing depression[5]. Prevalence is higher among young Māori and Pasifika Peoples, and New Zealand's teen (15-19 year-old) suicide rate is among the highest in the OECD[6,7]. Treatment for mental health remains generally under-accessed by youth[8].

Likewise, there are ongoing calls to strengthen effective interventions for childhood conduct problems to stem later antisocial behaviours. As noted in Sir Peter Gluckman's taskforce report *Improving the transition* (2011), "the seeds of many adolescent difficulties are sown very early in development"[9(p59)]. Related to this, Adverse Childhood Experiences (ACEs) are an emerging area of focus for Chief Science Advisors in 2016.

> Our interest lies in understanding the 'promise' of technology, and its effectiveness, for delivering prevention and intervention services promoting *behavioural change* and therapeutic support to customers.
>
> Our focus on tools with peer-reviewed evidence excludes the vast number of commercial, private and user-developed online interventions which can have very high uptake. These can also be more innovative and quickly developed than evidence-based and evaluated interventions. Any development of digital initiatives should also look to learn what works to attract and serve users in popular tools, even if not scientifically validated.

The importance of supporting parenting practices is well established[c]. Under a life course model, a critical factor in a pre-schooler's later outcomes is the quality of parenting or "the extent to which parents are responsive and supportive to their children's developmental needs and skilled in managing their children's behaviour"[10(p168),11]. In New Zealand, the value of parenting support services, including programmes, has also come under the spotlight following the 2016 report on reforms to modernise Child, Youth and Family.

When young people look for help, they prefer to go online – this can suit parents too

Barriers to getting help and conventional in-person treatment broadly overlap for both our areas of interest. These include perceived stigma, shame, cost, transport, waitlists, scepticism, distrust of the system/professionals, work commitments, rural isolation, and low mental health literacy, including poor awareness of signs/symptoms and resources. While home visits are known to be effective for reaching parents, there are limitations to resourcing and some families are also resistant to these[12,13]. Overseas consumer preference research reports that low-income and vulnerable parents, including Hispanic and African American child welfare populations, highly favour the web as a channel for receiving parenting information and programmes[14,15].

In 2015, the New Zealand Health Promotion Agency reported a growing tendency for people to go online before (if even) going to a GP or nurse – especially for 15-24 year-olds[16]. These findings are corroborated by a Youthline-commissioned survey (2014) which found the internet to be in the top two channels used to source information on 'sensitive' topics [sex, drugs, alcohol, depression] by 90% of respondents (n=403), compared with friends (76%) and with 'qualified help' (talking to their doctor (16%) or a school counsellor/nurse (15%)[17].

Technology offers one possible way to overcome these and other road-blocks for people with different levels of need and at different levels of service intensity or support. It also aligns with two key pillars of the refreshed New Zealand Health Strategy (April 2016): 'people-powered' services that are accessible 'closer to home' – "where people live, learn, work and play"[18(p19)].

Primary reasons cited for **not seeking advice** from a support organisation were **embarrassment, not wanting to talk**, and thinking the **problem would either go away** by itself or was **'not big enough'** to ask for help[17].

Digital platforms lend themselves to delivering preventive and self-managed care options

For many, it may be enough to find information on websites themselves – adapting the profiling of different client types by The Productivity Commission, these might typically be users with low complexity of need and high capacity (the 'straightforward', self-managing quadrant)[4]. They can look after their own health or parenting needs with only passive support from promotional material. This describes a form of self-care which is valued as a core principle of public health management and translates also to parent education as a prevention strategy to mass populations.

Empowering people to manage their own wellbeing in the first instance is a common refrain of 'consumer voices' and research alike, and is further expressed by the Ministry of Health's aspiration that all New Zealanders 'live well, stay well, get well'[18,19]. Promotion of self-care in community settings via electronic and mobile health technologies is notably recommended by WHO in its *Mental Health Action Plan 2013-2020*.

The principles at heart – autonomy, control and choice – align with the advantages of digital technologies in offering '24/7, A3' access – anytime, anywhere, any place, with anonymity too.

'Going digital' to provide services presents an appealing value proposition not only for users but for the system as well. Commonly cited benefits include:

- potential efficiency gains
- reducing burden and social cost through scalability
- standardisation/fidelity of programmes with ease of updating content
- facilitation by non-professionals
- cost-effectiveness
- sophisticated analytics.

Some people may need more active guidance or intensive treatment than others. This equates to mid-levels of pyramid or spectrum service models which layer additional support at a secondary level (more targeted to those with risk factors or symptoms) and escalate, least frequently, to specialist crisis response[8,85].

Safe use is a critical concern

There is a serious flip side, however, to the use of online tools, especially by vulnerable people and in an unguided and socially isolated environment. While self-care can be empowering, it presents a number of risks, including under/over self-diagnosis and potential harm from reliance on advice from online sources which may not be moderated or clinically tested and developed[d]. Briefing schools and parents on 'red flags' is one way young people have seen for proactively addressing this[20].

Embedding clearly visible crisis support information and phone numbers is an essential part of responsible design. While active monitoring of e-tool users with high or worsening self-reported depressive symptoms is ideal, automated recommendations that they see a provider is a good first step.

Good practice for **managing inappropriate use** includes **triaging** at a controlled access point. This may be through **referral** or other mechanisms, e.g. **online assessments** through log-in/registration processes or **in-person screening** before being granted access[21].

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d. We further note potential harm from cyberbullying, internet addiction, unsafe information disclosure and social contagion.

The types and uses of technology for behavioural change are vast and constantly evolving

Table One outlines some of the different types of technologies and 'positive' applications used to support wellbeing. It is intended to give a sense of the wide array of possible uses in a rapidly changing market – as such, some examples are peer-reviewed but not necessarily publicly available, others are in development or well-established but not necessarily evaluated.

While single tools might have different multi-media components and serve several functions, they can be broadly grouped by their primary use for:

- therapeutic treatment
- [self-]monitoring
- online support.

Table one: Examples of delivery platforms and types of applications for wellbeing services

Types of tools supporting behavioural change	Brief description and examples* (NZ) New Zealand-developed * Including some for all age groups (from ≥16 years)
THERAPEUTIC TREATMENT with evidence-based content/approach	
Web-based programmes	Generally structured modules which provide information, teach self-awareness and build practical skills over time as 'psycho-educational interventions' **Mental health:** (NZ) The Journal; MoodGYM; myCompass; Beating the Blues; BRAVE-ONLINE; SilverCloud (including eating issues); Stressbusters; Netmums (post-partum depression) **Parenting:** (NZ) Play Kindly; Triple P Online; Parenting Wisely Online; Positive Parenting Solutions; Trust-Based Relational Intervention (TBRI) – Online Caregiver Training; Strongest Families Smart Website; Children of Divorce-Coping with Divorce; Comet (parent management training)
Text counselling and web chat	Enables young people to have 'therapeutic conversations' with a trained counsellor, on an as-needed user-determined basis (often intense but relatively brief interactions) (NZ) Youthline; (NZ) 0800 What's Up (Barnados online chat for kids and for teens, developed with Lifehack)[23]; Childline (UK); Kids Helpline (Australia); eheadspace (Australia) online support
Serious games	Gaming for serious [health] purposes draws on simulated learning environments, involving multiple perspectives, learning through immersion, action-based activity, role play (personae/scenarios) and guidance[24]; virtual reality exposure therapy is another strand (NZ) SPARX; SuperBetter; ReachOut Orb; Pesky gNats
Videoconferencing and coaching	Therapy provided in real time using online teleconferencing services I-PCIT (Parent-Child Interaction Therapy) guides live parent-child interactions in families' own homes (adapted from traditional coaching from behind a one-way mirror/another room)
In-the-moment self-help	Users access strategies to help manage acute situations such as anxiety attacks or temptation for addicts, e.g. breathing techniques, self-authored coping statements, geosocial networking support (NZ) CalmKeeper app; PTSD Coach Australia Users can also schedule times for dealing with non-acute matters, e.g. ReachOut WorryTime app

Table one: Examples of delivery platforms and types of applications for wellbeing services (continued)

Types of tools supporting behavioural change	Brief description and examples* [NZ] New Zealand-developed * Including some for all age groups (from ≥16 years)
[SELF-] MONITORING through self-reflective activities, quantitative and qualitative data collection	
Apps	'Self-tracking' through diarising (including blogging) and other self-reflective activities
	For an individual's own use ('self-hacking') and/or for clinicians (monitoring function) – > real-time self-reported information and behavioural data can support 'ecological momentary assessment'[25] and potentially also real-time intervention (therapeutic advice)
	[NZ] '1 in 3 Be Free' (for women to screen relationships for abuse and connect with support); [NZ] Mood Diary; Family Lives' TeenBoundaries; Apps in development at the Black Dog Institute (Australia) include one for helping young adults manage bipolar disorder and the iBobbly tool for suicide prevention in Aboriginal and Torres Strait Islander youth
ONLINE SUPPORT promoting coping and other behaviour	
Peer support groups	Connection and social support provided through chat rooms, discussion boards, email or social media – closed settings allow more content control and safety, 'e-meditation' by moderators (nurse/social worker/other professionals) may also add therapeutic benefit[26,27]
	Popular among groups going through a shared experience, such as recovery support and for parents of children with complex and unusual medical conditions
	[NZ] The Lowdown; Big White Wall
Tips on the go and advice	[NZ] Tapuaki Pacific Pregnancy and Parenting app, including links to services and organisations e.g. birthing units, rental agencies, support for breastfeeding, fathers, and drugs and alcohol
	Websites going beyond passive information delivery to offer interactive components, self-assessments, suggested therapeutic activities and [clinically-reviewed] content, e.g. [NZ] Bounce

The promise is clear but evidence of effectiveness is not

Glancing at Table One, we can see some exciting potential. But if the promise is clear, the evidence of effectiveness is not. We generally find, with the UK's National Collaborating Centre for Mental Health (2014), a "high noise to signal ratio"[20(p115)] and the lack of a strong clear message coming from the 'torrent' of studies on e-therapies. To date these fields have tended to attract lots of isolated small pilots (funded as innovations or even produced as postgraduate outputs) with inconclusive findings and short or untraceable lives[28,29]. The volume and quality of research is mixed, with the proliferation of e-tools and pace of technology not matched by research and evaluation, which is not routinely carried out and/or inadequate[28,30,31].

Under a tiered approach to standards of evidence[e], the quality of evidence from this growing field could be positioned at lower to mid – levels (at best)[20]. Even where randomised controlled trials (RCTs) exist, there are often shortcomings in methodologies that downgrade the strength of evidence[f].

Authors of systematic reviews and meta-analyses on e-tools for youth mental health and parenting frequently cite the heterogeneity across research designs and studies, including variation in content, delivery and effect sizes, which makes it difficult to generalise findings that are sometimes also conflicting[21,25,32–36]. We can nevertheless glean insights from these sources.

Our plan for charting and understanding the evidence

I.   **Get a high-level view:** Draw out common threads from systematic reviews on the most established types of e-tools (therapeutic programmes)

II. **Dig deeper to learn about good practices:** Look at what worked (and what didn't) from particular cases to illustrate design and development considerations, touching on:

• intended users • the question of support (relative to traditional face-to-face modes) • design forms and processes • implementation and uptake • quality assurance

Reviews tell us e-therapies for mental health may be an effective option for young people when in a structured, hands-on and skills-based format, with some degree of support and targeting

Along with 'active support' for healthy living, psychological therapies are recommended as a preferred first-line treatment for young people with mild to moderate depression and also for anxiety[9,37,38]. Following generally positive impacts of computerised cognitive behavioural therapy (cCBT or iCBT) programmes in adults (and official recommendation of cCBT as a treatment option by NICE and others)[39], global interest has more recently turned to the development of e-therapies for youth and children.

High-level findings from systematic reviews and meta-analyses on international e-mental health interventions for young people include:

- **Overall support for the effectiveness of cCBT** in reducing symptoms of depression, and also (low level) anxiety, relative to a control (with some studies finding sustained effects at follow-up)[20,21,32–36,40,41].

- Online therapies may be **at least equal to face-to-face** for both depression and anxiety, with some variability in effect sizes between clinician and self-ratings[20,21,33,35,36].

- **The importance of support** – Studies generally found some form and degree of therapist support variously associated with higher acceptance, adherence, completion and/or outcomes of online interventions, with more nuanced research needed (e.g. to understand minimum resourcing and maximum efficacy)[g,20,21,32,33].

- **Active, skills-based interventions structured in module format** are more likely to have a positive impact, although more research is needed to identify specific aspects of internet interventions responsible for success[32,33].

- The need to **consider targeting:**

  - **Specific conditions** – Depression and/or anxiety: there is some evidence for treating both problems at the same time[33,36], but needs more comparative trialling[21].

  - **Specific purposes** – Using a single tool for both prevention and treatment purposes may work at lower levels of intensity[35], but it may be more effective/appropriate to match therapeutic focus to the stage of disorder, e.g. relapse prevention[32–34].

  - **Specific populations** – Looking at subgroups, studies suggested moderating effects of age as well as severity of condition: cCBT has been found more effective in adolescents than in children, especially for anxiety[20,35,36].

- **Adherence and attrition** problems in trials (also common in face-to-face treatment), and uncertainty about optimal dosage[32–34].

- Findings suggest potential **as standalone (preventive) tools or alternatives to face-to-face help** where not available or wanted, commonly viewing use as a **'stepping stone'** or **'adjunct' to in-person** treatments, with general agreement that e-therapies are **not to replace** but to **enhance traditional services and systems**[21,26,35,36,40].

- Limited evidence on computerised therapies other than CBT[20,21,33,35].

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g. Different conditions, stages and/or ages may require different levels of support (e.g. more for anxiety than depression[35]).

Table two: Examples of evaluated e-mental health therapies available in New Zealand

Programme	Key findings in evidence of effectiveness
BRAVE-ONLINE (Australia) Ten session CBT-based programme, with two booster sessions, to help children (8-12 years) and teenagers (13-17 years) learn how to manage anxiety and fears, including social and more general worries, separation from loved ones, fears of specific objects or situations, and school performance. Includes six dedicated sessions for parents. Free access to the self-help version across Australia since May 2014.	Following a promising feasibility study[42] in 2006, BRAVE-ONLINE was found to be as effective as in-clinic treatment for children (2009)[43] and for adolescents (2011)[44], with improvements maintained or enhanced at follow-up (75% of cCBT children no longer had their primary anxiety problem at six months; almost 80% of the cCBT adolescents reported this same outcome at 12 months). **BRAVE-ONLINE-TA (Therapist-Assisted) – Canterbury and West Coast** Following the Canterbury earthquakes, BRAVE-ONLINE was piloted by a small group (n=42, 2012-13) to test local acceptability and found to be effective. It has been DHB-funded and is available by referral in this area. **Adaptability:** While its licensed content lacks cultural relevance for New Zealand, its use has been adapted to the community's post-disaster context. The therapist supported-version has been used to better manage risk and is to triage for other conditions – some children, for example, are presenting with PTSD or serious behavioural problems rather than the mild to moderate anxiety it is designed to treat. **On-the-ground experience:** Implementers have found it works best for 8-12 year-olds with parent support (some 7 year-olds finding the reading level too hard), and for motivated teenagers; advice on the common parenting trap of avoiding exposure works especially well; parents report their children are more confident and coping better. **Challenges:** Better understanding why those who are referred do not take it up; cost of purchasing a limited period licence; uncertainty about dose (how many sessions are enough); limited systematic collection of feedback and metrics to date[45]. **'Preschool BRAVE' (2014)** A six-session programme for parents (n=52) of 3-6 year-olds with anxiety was found to be feasible, efficacious and well received (greater reduction in children's symptoms and severity compared to the control group, with gains maintained at six months)[46].
SPARX (Smart, Positive, Active, Realistic, X-factor thoughts) One of the initiatives of the Prime Minister's Youth Mental Health Project. CBT-based interactive fantasy game in which users restore balance to a world dominated by GNATs (Gloomy Negative Automatic Thoughts). Seven modules to complete sequentially, with self-evaluation, exercises and 'homework', customisable notebook, texts or emails to users (but no external practitioner support). Free, open access within New Zealand since May 2014 (requires log-in).	In 2012, SPARX (n=94) was reported to be at least as good as 'treatment as usual' (mostly trained face-to-face counselling, n=93) by 12-19 year-olds, with clinically significant reductions in depression, anxiety and hopelessness, and improved quality of life; effects were maintained at three months and adherence rates were high[47]. SPARX has also been found to be as effective as a school-based CBT programme and an active self-monitoring control condition in reducing depressive symptoms in the Netherlands (2016)[48]. Testing in Australian high schools has shown promising results too (Perry et al, paper forthcoming). **Alternative education** In a small RCT with young people in alternative education programmes, SPARX appeared to reduce depressive baseline symptoms[49]. Participants generally found SPARX to be effective in dealing with anger, reducing fighting and making them feel calmer (i.e. dealing with 'life hassles', rather than depression specifically)[50]. **Young offenders** A slightly revised version of SPARX (SPARX-R) has been tested in a New Zealand youth justice service (Fleming et al, paper in preparation). **Rainbow SPARX** In an exploratory study (2013), a modified version for young lesbian, gay and bisexual people showed promise with focus groups which provided suggestions to improve the relevance and appeal of the prototype[51]. **SPARX App (due for release in 2016)** A planned app version will build on and improve elements of the web-based game, incorporating a stronger sense of personal progress and companionship, and noting feedback about over-reliance on text and clunky controls[52]. This may partly address concerns from the Dutch study that SPARX was seen as outdated and too didactic.

Emerging evidence shows online parenting programmes can improve parenting and child behaviour, with some degree of support and targeting

Grounded in evidence-based approaches including social learning models[53] and self-regulation theory[14] as well as CBT[54], parenting training interventions are recognised as first-line treatments for managing problematic behaviours in children[20,53] and are gaining traction as technology-enabled service offerings.

While migration online is still in its infancy, with shortcomings in programmes and evaluations, systematic and meta-analytic reviews again provide common threads, many of which converge with those found for cCBT for mental health.

- Some evidence of **positive effects of digitally-delivered parenting training**, relative to control groups[10,27,53], on parent and child outcomes, ranging from attitudes and emotional symptoms to parenting strategies and skills (measured by external observation and/or validated tests but sometimes only self-reported).

- **Targeting purposes and populations** may be more effective, in line with findings, for example, that programmes "addressing a specific issue seemed to be more successful than general programs for common parenting support"[27,54(p1827)].

- Level of **support is important** – Use of technology with support from professionals may have stronger effects (engagement and positive outcomes)[27,54] than fully self-directed programmes, although more research is needed into the effectiveness of digital delivery with and without different types of support and the value they add (including whether they are only needed for certain populations, e.g. high need)[10,55].

- Isolated studies have **indicated effectiveness comparable to in-person** treatment[27,53] but the relative impact of technology is largely **under-studied, needing more research** on whether it yields equivalent or better results than traditional methods[10,27].

- **Transferability is not a given**: digitally-delivered parenting programmes are commonly adaptations of evidence-based face-to-face interventions but are not necessarily successful online[54].

- General **adherence and attrition problems** (also common in face-to-face treatment), raising **questions about minimum dosage** (number of completed modules needed for impact)[10], noting also that non-completion does not necessarily mean no effect.

- Online parenting training programmes are regarded as a **useful option in a blended approach** with support from professionals[27], integrated into [primary care] service settings[53].

Table three: Example of an evaluated e-parenting programme available in New Zealand

Triple P Positive Parenting Program Online (TPOL)
 	
Based on globally implemented in-person Triple P treatments (>200 evaluations).
 	
Eight sequenced modules at Level 4 (with 5 being most intensive), for families of children (toddlers up to 12 year-olds) with moderate to severe disruptive behaviour.
 	
Goal setting, self-evaluation, exercises to check mastery, video content, podcasts, downloadable worksheets, tip sheets, customisable notebook, texts or emails to remind parents about what they've learned and to prompt participation (but no external practitioner support).
 	
Payable, access expires after three months.
	Compared with internet-use-as-usual (n=56), TPOL participants (n=60) were reported in 2012 as significantly improved on parent-reported measures of problem child behaviour, dysfunctional parenting styles, parental confidence and anger, stress and conflict; effects were generally sustained at six months, even though <50% completed all eight modules over three months (results were comparable to in-person group and offline self-help versions of Triple P)[14].
	
	Improvements in child behaviour and parenting following TPOL use have also been found in a number of other studies:
	
	• TPOL was found as effective as Self-Help Triple P delivered by hardcopy workbook in New Zealand[56]
	• TPOL for parents of hyperactive/inattentive pre-schoolers (preliminary findings of a New Zealand RCT)[57]
	• TPOL Brief (lower intensity version)[58]
	• TPOL with and without additional phone support was found more effective than the control[59]
	• Predictive study in New Zealand in which:
	  • child behaviour outcomes were predicted by the number of sessions completed by family, and by the quality of mother-child relationship at the outset
	  • effective parenting was predicted by baseline levels of ineffective parenting for both parents, and by session completion for mothers[60].
	
	Developing a Teen Triple P Online Programme is a future research direction.

Digging deeper to learn about good practices

Looking across the big picture themes noted above, we now draw on further examples and drill down into key areas to learn more about what works for whom and in what context.

In this section we look at the importance of identifying intended users and uses, and how design can be optimised to suit a range of backgrounds, needs and preferences. We consider questions of tailoring to different backgrounds, providing the right amount of treatment, and offering support.

Informed design: know your (un)intended users and give them options

We see in the above examples of BRAVE-ONLINE, SPARX and Triple P Online movement towards diversification and spin-offs – trialling different options for different segments of the population.

Systematic reviews, particularly on e-parenting training, have nevertheless found that still not enough is known about the populations most suited to different technology-enabled interventions[27,53]. Testing 'acceptability' and measuring user satisfaction at the development stage

At the heart of **understanding fitness-for-purpose** of a programme or tool, we need to understand **intended users, their needs,** how interventions can **best serve and support them,** and at which **level(s) of intensity** of the service model.

goes part way towards this but is not always done, nor is it reflective of 'messy', uncontrolled real-world environments[h,25].

In looking to real-life everyday use [by a referred and/or general population], programme developers must start by understanding their target demographic, including those who currently under-utilise services[61], as well as those for whom use of e-services may not be appropriate or present risk to manage (such as those with suicidal thinking, certain panic and personality disorders and parents with elevated child abuse potential)[i]. "In-depth insight into intended consumer behavior and their environments" is also seen as critical[29(p2)].

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h. Where interventions are trialled, study samples have been found to be biased towards certain groups (e.g. tendency towards females and where known, higher socio-economic status and educational attainment, with few focusing on ethnicity or including those with severe symptoms)[61]. It's also worth noting here that 'acceptability' has different meanings in policy and clinical worlds[61].

i. Some interventions nevertheless attract users with more severe symptoms who may also show improvements.

Universal use of therapeutic programmes?

As indicated earlier, e-therapies have generally been found to be more useful when targeted to particular populations for particular purposes and particular disorders.

However in some instances it may prove useful to offer a low intensity intervention on an open or universal basis, on the proviso that it does no harm, with benefits to a general population being a bonus, and serving a preventive or promotional purpose.

"everyone has down times"[50(p6)]

'Institutionalising' with a captive audience, such as at school or in alternative education, requires skilled facilitation but may avoid stigmatisation[50]. This may also involve rebranding as wellness, resilience, 'life enhancement' or mindfulness-type tools, rather than mental health treatments as such.

A whole-of-population approach has preliminary support from findings on Triple P Online[15] and also users trialling its social media version – "if everybody did it, there'd be no judgement"[62(p10)].

Delivery of CBT via mobile phones (MEMO: living in a positive space) has been found feasible as a potentially large-scale prevention initiative too[86]. While use of SPARX in group formats is identified as an avenue for further exploration, researchers' calls for caution in any large scale roll-out should also be noted[48].

The field of behavioural intervention technologies is evolving...

Better understanding users and how they interact with technology involves mining usage data and other sources of information to look at patterns of use, consumer preferences and outcomes relative to engagement[30,61–63] – this is important for design teams as well as funding and other decision-makers.

Adjustable size to fit many... options for tailoring and customising

While children, youth and parents may face common challenges, they are not of course homogeneous groups[28]. Individual personalities, priorities and treatment preferences will always play a part[40,64] – what are facilitators for some are barriers for others[61].

Targeting intended users of an intervention involves tailored design, ideally with options for empowering users to personalise their experience. But again, the degree of customisation within an intervention will depend in part on the intended purpose, demographic and scale as well as practical considerations limiting resourcing and functionality. Examples that follow illustrate this.

Appealing to different backgrounds?

Video modelling has been found to be an effective component of online parenting training but formats for broad dissemination may not have relevance or impact for different geographical, ethnic, socio-economic scenarios[10]. While even 'socially validated' community-created videos or 'voxpops' might still inevitably fall short for some, part of the answer may be to offer users the opportunity to record their own stories.

Likewise, SPARX was designed for use by all ethnicities and allows users to choose the skin colour of their character. It also incorporates Māori elements (graphics and tikanga) which Māori users have found appealing... and non-Māori too (see later text box). A group of young rural Australians found neither the Māori-inflected NZ English accent nor the style off-putting (the graphics being seen as not out of place with the fantasy game setting)[65]. The lack of cultural adjustments in a Dutch version (limited to translated words only) may have nevertheless contributed to schoolgirl users' struggle to relate to and identify with the characters, in turn affecting their engagement and/or the game's effectiveness[48].

Enabling users to **self-select goals, with free text entry,** is also seen as a simple way for individuals to **reflect their own values, cultures and traditions**[14].

Features of a basic template for digital tools supporting healthy behaviour change

👍 **Instructional design/learning mechanics** to maximise educational gain with multiple opportunities for practice of taught skills ('homework'); interactive, structured, with tasks and activities; personalised goal setting, review and feedback[20,24]; individualised components such as 'bags of tricks' for self-selected parenting strategies[76].

👍 **Practical tips and tricks are simple, so easier to remember**.

👍 **Look and feel that appeals**, including an enjoyable and "graphically rich experience"[24(p2)] with multi-media components and easy user-friendly navigation, noting that humour can be important[52,87] and elements of distraction and escapism too but that what's 'cool' can turn to 'old school' as on-screen aesthetics also rapidly advance...[48].

👍 **Appropriate language and literacy** – Relatable wording (including users' colloquialisms – slangy but not too slangy[71]) pitched to reading, English language, health, information and digital literacy levels. Traps include too much text and use of [medical] terms when youth don't know the language (or don't want it to be too obvious that a tool is about mental health)[66,69].

👍 **Integrated crisis prompts (emergency numbers)** and information.

Not too fast, not too slow, and the right amount: parent-led sequencing and pacing?

In recognising the issue of attrition through user frustration at slow pace or linear drip-feed of content (which users may also see as irrelevant), programme developers and researchers are looking at 'mini' (abbreviated) and non-sequential versions in which parents can select the amount, frequency, and type of content after a number of core sessions. 'Self-administering', especially without guidance, carries risks and uncertainty remains about dosage – identifying the minimal amount of treatment users need to get [clinically] better is a priority in e-therapy work.

To give a parenting example, TPOL Brief, a 'consumer-informed' adaptation of the standard programme, for example, saw TPOL reduced from eight to five modules and available in a non-linear format[58]. But despite high scores for user satisfaction in a RCT with parents of two to nine year-olds, only 40% completed all sessions, with 25% not completing the first (longer two hour) module, and 62% completing the minimum dose. Effectiveness was related more to *who was using it*, rather than how many modules they finished: improvements in child behaviour problems were more likely in older parents and those with higher baseline problems, with completion not a significant predictor of outcomes in this case.

In general, however, treatment completion increases the likelihood of some gain, with some studies finding larger effect sizes associated with higher adherence.

🔍 Factors influencing online programme completion are another key area of research, with particular interest in how best to allow users to progress through training, balancing the need for the right pace, session duration and time to consolidate learning – new material might be 'unlocked' based on time, task completion, both, or from the beginning...[10,30,53,54]

Allowing for 'snactivity' – small 'bites' when users need or fancy 'a little something' – is becoming an increasingly important consideration.

Naturally variable patterns of use can see individuals engage on and off with a service (whether online or offline), stopping when they feel like they don't need any more help and dipping back in at more acute moments.

This usage may not reflect the ideal that they continue with a programme to build skills over time for longer-term resilience, but that's reality for many young people and time-poor parents too. At the same time, growth in individual smartphone usage aligns with a shift towards mobile-based tools, supporting offerings like therapeutic 'mini games' that could be played during down-time at bus stops or in waiting rooms.

Online self-help or help from real others?

As we noted earlier, programme completion and/or gains may also relate to the level of support from others. This is an important consideration in any provision of online self-help, and a critical concern for many – practitioners, policymakers, prospective service users, non-users, families and whānau alike: even if it might be shown to be effective, interacting with a screen isn't the same as talking with a real person in real life.

> "I would **dis every** [in-person] **appointment**"
> "I would **rather stay** in the **'hood**"[66(p199)]

> "...personally I prefer [...] **being able to look at someone** and know that they're **there if you need a hug** or anything you can get it, whereas over text you can't get those things"[64(p102)]

> "I dnt reli want 2 tak on da fone rite nw coz **i dnt hav enuf confidnce** bt i mite rng u lata if i can"[67(p6)]

'Screenagers' may want or need the best of both worlds – privacy (self-directed help) *and* a supportive relationship, with or without 'face time'...

At the core of therapy is a relationship, sometimes referred to as a 'working alliance', between an individual and health professional or social worker as an agent of behavioural change.

Research on the priorities of young people in conventional counselling tells us they value a sense of connection with their therapist that enables them to express themselves openly with a feeling of being cared for, but not judged[20,64,68]. But at the same time, young people are known to feel threatened by or resistant to these types of intensive in-person treatments, not wanting to feel patronised, controlled or vulnerable in an uneven power relationship with an adult[64,66].

Technology can offer a safe space in which young people may feel less intimidated to express themselves freely, with the versatility of different ways of talking in different formats with different levels of relational support, both on and offline. In other words, it doesn't have to be an 'either/or' but an 'and/or', 'and/and' strengths-based, user-choice approach. After all, some days users may not have the stamina or self-motivation to do it by themselves.

We now consider a range of ways in which support can be built into, or added onto, digital tools.

Figure one: The SPARX Guide

Guidance can be built in, implicitly or explicitly

A therapist may appear in embedded videos, leading users through a programme as with Triple P Online guided by the developer, Professor Matt Sanders.

Alternatively, the therapist may take the form of an avatar, an animated character or virtual 'conversational agent' who can 'listen' to and interact with the user, modelling behaviours, teaching practical [CBT-based] techniques, guiding them in their thought processes and decision-making.

This model is used in SPARX where a virtual therapist with a "warm encouraging voice" provides observer perceptions, reflection and encouragement – 'the important thing to know about feelings is that they change', 'you're not the only one'. Users have experienced the Guide (Figure one) as caring[50], and also seen him as a role model, with some finding him "mean as"[69(p5)], and others appreciating the Bird of Hope character too. But while gamers may respond well to this modality, it may not appeal to everyone as the Guide acknowledges in the game itself, with suggestions of other ways and places to get help.

Elsewhere, in a social media-enhanced version of Triple P Online (TPOC), accredited facilitators were an integral part of the intervention – they responded to posts, answered questions, rewarded parents' shared strategies and promoted exceptional examples as well as monitoring the discussion boards. The therapist component notably scored the highest mean rating of all the tested features, with one person explaining they valued the reassurance that they were "doing something right" (although others missed having a staff person on site)[61].

Therapists can also take the guise of... speech bubbles on a screen.

Despite the absence of all audio-visual cues and its short, often one-off nature, the direct relationship established between individual text counsellors and service users has been found to be effective. Qualitative research has found Youthline's text counselling service to provide emotional support[67]. In a small exploratory study, user voices again reported a caring element – that text counsellors feel like friends, and that they're inclined to reveal more than in face-to-face as it's seen as less embarrassing. A minority (of the 21 participants) missed a physical presence.

"It's not like a text, but she's like a person"; "...he actually seemed like he cared"; "...they are able to help and not sort of look at you like you are weird"[64(pp100–101)].

"Client: ... i js cant stop crying. Snds stupid I kno

Youthline: Its ok 2 cry n be sad abt losin ur dad. Ppl r all different wif way they react 2 things

Client: I dnt knw.Mayb I jst bein silli I dnt even knw why I txt ths,u cnt chnge anythn

Youthline: We cnt change it, but we can offr supprt n b here to txt n tlk 2

Client: Crazy he was sick 4 2yrs, u thnk I wld get used 2 the idea I knew it was gonna hapn

Youthline: Knowing tht it wld happn an actually facn it can be very different. It's a big chnge nt havn him ther anymore..."[67(pp8–9)]

Choices, choices, choices: GoForward @ Youthline

Adding to its free call, free text and email services, in 2015 Youthline developed a further suite of services known collectively as GoForward.

GoMobile – A ten-week text counselling programme for young people with mild to moderate anxiety and/or depression. Roll-out was based on the success of a small pilot ('Reach Out, Rise Up') with inspirational messages and weekly challenges (e.g. mood journaling, recognising small victories, trying new activities of choice)[71,84].

GoChat – Web-based counselling at peak times, 7pm-11pm. In line with shifts overseas to instant messaging channels, this option was developed to bridge phone and text services, allowing for greater crafting of messages to convey understanding and emotion.

GoGetter – Self-assessment quizzes offering a first step, to possibly 'nudge' someone needing support in the right direction.

GoLive – Online video counselling pilot with 12-26 year-olds.

GoSPARX – Provides information on SPARX and a link to the game website.

Responsive to user preferences, Youthline counsellors reply in text speak only when clients have initiated it[67], as some young people find it 'cold' or dislike ungrammatical speech[64]. The time delay between texts can also work in users' favour as it enables them to plan their responses and reply in their own time. For others however, the lack of immediacy or availability of counsellors can be frustrating[64].

The strength of the rapport and feelings of personal relevance are seen as measures of success of e-counselling services such as this[64,67,70]: users of Youthline text counselling have found it helpful for providing the opportunity to talk and work through problems in the moment as a brief intervention. While long-term therapeutic effects are not the intent, some have notably reported learning or developing self-coping strategies, e.g. "When I don't use [Youthline] I just kind of text myself…"[64(p101)].

Support can also be 'added on' in various forms and guises

'Telepresence'[63] (text, email, videoconferencing, phone, online support)

Text messages or email can be used to encourage adherence, with a range of possibilities:

• Standardised – From a stock supply, can be activated by usage data as a reminder to complete programmes.

• Customised – Users select [self-composed] messages, the number and time of day (when they feel particularly vulnerable, e.g. before or after school[30,71]) or opt out altogether[j].

Technology can also provide contact with a practitioner before, during or after use of an e-tool. In some cases, for example, therapists use videoconferencing to review each online session with parents; in others real-time remote coaching components are part of self-directed web modules[54].

Where a coach monitors and reviews progress with a user on a scheduled basis[30], a 'supportive accountability' effect is thought to enhance adherence (although avoidance and other reverse effects are possible). In practice, additional phone support to users of online or text-based services may[59] or may not[71] be associated with improved outcomes, but has generally been appreciated by users in trials (noting also that call content may vary from one support person to another)[k].

Peers can also provide forms of supportive accountability, although often in more ad hoc but immediately responsive ways, and associated with more attitudinal, rather than behavioural change, outcomes[54].

j. Abroms et al. (2015) offer useful guidance in their paper, "Developing and pretesting a text messaging program for health behavior change: Recommended steps".
k. Users of Triple P Online (TPOL) receiving accredited phone support reported higher satisfaction, had higher completion rates and better outcomes than both the control and TPOL with no additional support[59]. While 85% of participants in the small 'Reach Out, Rise Up' text therapy trial found their additional phone support to be beneficial, there was no significant difference in effectiveness between supported and unsupported users[84].

Social networking and online support groups have been found useful for moving through online programmes as a community, such as in Triple P Online Community. Elsewhere the developers of SPARX saw it important for users to interact with other characters to simulate a problem-solving community and provide a sense of connectedness with relevant others[24]. This may be further enhanced in future iterations of SPARX.

Human presence (local in-the-flesh, on-the-ground support)

Supervision of intervention delivery in a school or other community setting, by clinical or lay staff, is thought to be useful for supporting participation and adherence, although efficacy has been found variable (direct effect on outcomes is not clear).

In-person support is more typically accessed when a digital tool is used alongside or as a stepping stone to or from traditional face-to-face services.

The point in time at which a digital service might be used within a wider package will depend on a number of factors including access (open or restricted) and design (e.g. hybrid, for use by both practitioners and patients)[I].

Readily available low-level online interventions, such as text counselling and Hawke's Bay DHB's FlaxAID app, can improve mental health literacy and be used as a gateway into other in-person services, such as Youth One Stop Shops[8,64,72]. Social workers saw SPARX, for example, as useful for giving youth, especially boys, the language to use to talk about problems in a face-to-face setting[68]. Indeed, contrary to concerns that use of open access e-therapies might reduce adolescents' inclination to ask for help from adults, user feedback on SPARX suggests that this might not in fact be the case[50].

Digital tools can also be *used between* conventional treatment appointments, providing 'clinical extension' and potentially reducing the number of face-to-face sessions while also **directing resource** to those with **more complex needs**[40].

Guidance and support options within interventions and the wider system

Built-in therapeutic guidance

- **Implicitly (avatars)**
- **Explicitly (text counsellors, forum moderators)**

Added on support

- **Technology – in real time and/or delayed; customised or standardised prompts, messages of encouragement, automated or administered by lay staff**
- **In person**
- **Online peer support communities (can also be part of an intervention)**

Mix 'n match use

- **Standalone – entirely self-directed or with some support**
- **Blended alongside/before/during/after face-to-face treatment – sharing the different manners in which an online tool can be successfully used is a way of potentially improving effectiveness**

I.   A spectrum of therapist involvement in e-therapy is sketched in the *IACAPAP e-textbook of child and adolescent mental health* (2013).

Making e-tools available on tablets or computer kiosks in waiting rooms is also identified as a useful option[53]. Alternatively, office-bound professionals can use video technologies as a window into families' homes[53].

A small study with adolescents in a hospital-based mental health facility found that SPARX might serve as "an adjunct to inpatient treatment" (under clinician guidance but as respite from intensive face-to-face therapy) or as a means of bridging transition into community outpatient care[73(p291)].

Helping people to transition from treatment to supported independence to full independence is the core purpose of Whaiora Online. According to He Waka Tapu, this clinically-supported tool has seen over 60,000 entries since May 2014, with records showing positive behaviour change and improvements in quality of life of its 110-strong client group (see text box on page 18).

But as we can see, there are divergent findings on key factors from one study to another. So how can programme developers and providers know what's more likely to work for intended users? Involve them in the process as integral team members.

Literature supports the value – to promote adherence, if not also therapeutic gains – of providing **options *within* an e-intervention itself** (to customise in terms of relevance and preference), as well as **allowing for additional support options** from virtual or real service providers (clinicians or administrators). Studies also generally suggest a **blended approach** in which tested digital tool options are offered alongside in-person treatment as **part of a 'portfolio' of services**.

"When life sux, talk to Aunty Dee…"

Launched in April 2016, this free online tool uses structured problem solving, based on CBT principles, to guide users to work through any concern, brainstorm ideas to find a solution and write an action plan that can be downloaded or emailed and shared with others. As a brief and simple intervention, accessible on any web-based device, it was developed to be used on-the-go, as and when needed.

Co-designed with young people, the Le Va organisation targeted the tool to appeal to Māori as well as Pasifika (14-25 year-olds), noting the commonality of their cultures which value a collective approach. The 'aunty' figure stands for any number of caring women to whom youth might turn for advice.

While the 'guide' is static with no audio, Aunty Dee presents as sympathetic – "Don't worry, the process is quite simple"; "Problems with violence? Sorry to hear that"; "Thanks for sharing. It makes perfect sense that you're not feeling great". Collectively phrased wording gives a sense of partnership – "Let's go!". Beyond free text entry for problems and solutions, options for personalising extend to gender selection (transgender/"I'll describe it myself").

The tool was designed for use in the wider Pacific region as well as New Zealand, with local emergency numbers included for Samoa, Tonga, Fiji and neighbouring islands.

While no evaluative information is available yet, early feedback has been generally positive, with most users reporting they would recommend to a friend.

"It helped me stop and think about my current problems and organise them in a way that felt manageable. I love the step by step guide. It was easy, gave good examples and opened a space for me to be honest about how I was feeling."[88]

Technology as an option for supporting rangatahi Māori

Developed by Sir Mason Durie, Te Whare Tapa Whā is a well-established holistic model of Māori health in which spiritual, mental, physical and family dimensions form four mutually strengthening walls.

Guidance for clinicians on managing Māori mental health highlights the critical role of whānau and the importance of whānaungatanga, building a trusting therapeutic relationship with the patient and their support network[89]. In kaupapa Māori mental health services, "empowerment of tangata whaiora (people seeking wellness, mental health service users)" extends well beyond the individual (usually the focus in Western treatments) to also value kaumātua guidance as well as whakapapa[6,89(p13)]. Feedback from Māori users of Child and Adolescent Mental Health Services has previously suggested that rangatahi may prefer group therapy[90].

But while an "ideal intervention" might be "highly relational, involv[ing] families and whānau"[8(p28)], a host of factors, including engagement processes, need to be taken into account.

Mason Durie recognises this too, noting in 2014 the place for a blended approach for maximising communication impact for rangatahi engagements, which may include kanohi ki te kanohi (face-to-face), web, individual or group, and whānau modalities[91]. Advising that "virtual space may be less threatening to rangatahi in the 21st century", he also flags the use of texting to "bridge initial contact and reduce psychological distance". This supports Durie's three-part process for interventions with rangatahi: whakapiri (engagement), whakamarama (enlightenment), whakamana (empowerment).

Access to SPARX and any other appropriate e-therapy is recommended in *Hīkaka te Manawa: Making a difference for rangatahi* (2014) as one a range of service options young Māori and their whānau should be offered.

SPARX – towards 'blending cultural with clinical'?[92]

Avatar riding on Te Hokioi, the giant eagle representing wairua (spirit).

Recognising the importance of cultural relevance for Māori, the SPARX development team (which included a Māori co-creator, with input from kaumātua and Māori CBT practitioners as well as software design by a Māori-run company) undertook kaupapa-informed testing of the cCBT prototype with taitamariki as well as with whānau. This small study was thought to be the first time such an approach had been undertaken for indigenous minority populations and cCBT[69].

The focus group participants generally saw the potential for computerised therapy and supported the graphic design with its poutama, kauri, waka and other symbolic Māori imagery. They also notably placed importance in having SPARX characters outline their whakapapa and talk about their hapū.

Whaiora Online (He Waka Tapu, Christchurch-based kaupapa Māori NGO)

Using an interactive tool, individuals set their own goals (against four dimensions of Te Whare Tapa Whā) and monitor their progress which is charted by the growth of koru icons. An online forum promotes kotahitanga in a closed community setting in which whānau – with online and/or offline whakapapa – have ownership and leadership in supporting the wellbeing of a like-minded collective. Members can share content, links, photos, videos and event invites. While not specifically aimed at young Māori, *Hīkaka te Manawa* flags its use for peer support to rangatahi, with one third of Whaiora Online members aged 18 to 24 years.

Involve experts: good design involves end-users... right from the start

Ideally design of e-therapy tools should be informed by a theory of change and by evidence of effectiveness, grounded in a rigorous knowledge base[74]. But it's not enough to go on this one stream alone. Including prospective user input, alongside subject-matter expertise (including researchers, practitioners, software designers), is regarded as good practice, if not imperative[m,8,29].

Supporting 16-30 year-olds to help 12-24 year-olds, Lifehack seeks to embody this approach with its strong social entrepreneurship ethos and links with academia as well as communities to build capacity and leadership in research and development of youth wellbeing initiatives.

Participative processes can strengthen design and buy-in, although direct impact on effectiveness is not clear

A participative approach involving users can:

- allow their concerns and needs to be put forward and inform decision-making

- build credibility, promote ownership and buy-in

- strengthen design for richer and more relevant experiences[24,28,71]

- help bridge perceived generational, cultural and technological differences[64]

- support an outcomes view focused on service or product efficiency and value-for-money[29].

The rationale for involving end-users is straightforward, but how to do so meaningfully is less clear cut. A systematic review (2015) found that user participation in e-mental health interventions has tended to be limited to consultative and consumerist capacities and at specific phases only[29]. This lighter touch represents a reality gap from the ideal of active co-design from inception to evaluation. It may be due in part to recruitment and resourcing problems in pilots that are by nature exploratory and have limitations.

> **Not all participatory design (PD) approaches are created equal...**
>
> The term is sometimes used loosely to cover a range of methods from user-led to user-centred (but researcher-controlled) and community-based design, extending to include market research and service design[93].

While adopting participatory design might seem intuitive, its actual impact on the effectiveness of youth e-mental health interventions remains unclear, with a noted lack of published evaluation of PD use and consumer experiences of research[29]. A notable exception is the example of Lifehack which strongly values learning from participant experiences of its many ventures, including the Flourishing Fellowship programme, weekend events and innovation labs, collecting feedback through 'most significant change' stories, key reflection surveys and diverse other channels[23,75].

Examples of successful consumer input include youth designing supportive messages and advising on online etiquette as well as wording. Further insights on what has and has not been found to work in development processes of e-therapies are shown on the next page.

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m. Youth Engagement was an initiative in its own right in the Prime Minister's Youth Mental Health Project.

Factors supporting successful design processes[n]	Challenges in design processes
Flexible, responsive and well-resourced project plans with guidelines setting out consumer participation • Allow for generous resourcing (budget, time), e.g. ability to adapt to changing priorities, work styles, output standards – start-up costs can be high[76]. • Incorporate technical expertise at all stages and a feedback loop between users/researchers/implementers[77] (including testing for clinical validity, potential for harm, usability). **Recruitment both on and offline, inclusively and with care** • Involve those who will use and stand to benefit from the proposed intervention (to also ensure it is age and life stage/developmentally appropriate), and look after the wellbeing of participants. • Consider online participation, harnessing attributes of social media (being informal, scalable, open), e.g. for voting, sharing, 'crowdsourcing' content. **Culture of participation with activities encouraging input** • Make it fun, e.g. Facebook profile creations to explore possible scenarios of using services, and capture findings in ways that participants can understand. **In-person relationships with key community stakeholders, including outside champions and leaders** • Understand how communities engage with and adopt programmes, particularly where they are disadvantaged with barriers to traditional services[62].	**Plan for 'non-static' participation and include more families and influential representatives from intended implementation sites** • Expect fluctuation and attrition in participant groups – offer incentives and opportunities. • Establish early connections with intervention sites and community settings[o] where intended for integration into mediums and services already used (i.e. where screening and referral can occur). Skilful coordination is required, as well as more time than expected[8,29,61]. **Ethics of participation, house rules and duty of care are critical** • Ensure a safe space for at-risk youth to have a voice[29]. • Put in place a response procedure and referral arrangements for crisis support. **Manage expectations and assumptions, and get on the same page with a shared language** • Be prepared for differences in what is acceptable/effective between designers, researchers, and intended users (tensions are commonly reported between 'techies' and academics). **Constant iterations, not 'one-off builds' – build capability to keep up with technology[75]** • Focus on function rather than mechanics (not the device itself)[27,40].

Getting to market can be a road too long, with poorly mapped and under resourced integration as further barriers – shortcuts should still meet safety and community needs

As we've seen, authors of individual studies and systematic reviews alike tend to conclude on the potential effectiveness of e-therapies and other digital tools for use as a stepping stone or supplement to other support services. *How* this (blending) might be done successfully is less well or frequently studied.

Reality check: getting to market and surviving require translational research and ongoing resourcing

Our search generally found little focus on effective implementation and even less on integration of digital tools into existing systems of care, with lack of policy-focused research on e-mental health (mechanisms, benchmarked use, settings, planning, development)[61]. Cost-effectiveness also remains an assumption, not often evaluated[p,21,78,79].

Part of the problem lies in the lower rate of technology-based pilots even making it to market: survival in the real-world outside clinical trials is a challenge, with barriers to sustainability including resourcing (uncertainty of funding steams, capability and infrastructure)[28].

Without guaranteeing a long-term solution, forging partnerships with private, not-for-profit and philanthropic sectors may be one way of securing financing and [in-kind] expertise. Developers might also consider the lesson from Lifehacker experience about designing for the "natural, appropriate scale of user groups", however tempting it might be to want to put solutions out to 'the masses'[75(p31)].

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n. Hagen et al. (2012) provide a useful framework. The co-developed Youthline and Ministry of Social Development *Youth Mental Health Resources Guidelines* (2013) are also an important reference document.

o. See also Superu's *Effective community-level change* (2015) report.

p. A notable exception is the forthcoming PWC and Superu cost-benefit report (2016) on the Prime Minister's Youth Mental Health Project.

Proven parenting programmes are seen as ripe for conversion to online delivery but this is not necessarily straightforward or successful

An online variant of Incredible Years, for example, engaged participants but had only modest outcomes[10,14].

e-Chicago Parent Program (eCPP)[76]
The development involved three stakeholder advisory groups (parents; content developers; digital delivery experts) working over 12 months to adapt the face-to-face programme for digital delivery. Particular challenges included translating in-person group discussions and role plays to a self-administered digital format. Small preliminary tests of the prototype indicated usability, with success particularly attributed to the engagement of targeted recipients.

Triple P Online Community (TPOC)[62]
This social media variant of TPOL was designed for implementation at a population level for vulnerable young parents. A feasibility study found significant impacts on parenting practices, stress and child behaviour, which were improved/maintained at six months. However, for the researcher-developers the "most important activity for the success of the overall project was developing relationships with key community stakeholders"[62(p11)].

Matters raised for follow-up from the TPOC study included:

- testing assumptions about user behaviour (to inform interface design) following concerns that users were not exploring all resources from the site's menu, e.g. messaging the facilitator, the workbook

- identifying which features of social media are most engaging and what are unnecessary/distracting

- increasing the number of weeks to finish the programme, noting requests for longer access.

Play Kindly
Based on the USA Play Nicely programme and a CD-Rom version from the developer's doctoral research, Play Kindly was developed in 2015 for a local New Zealand 'urbanesia' context, targeted to help Pasifika parents manage challenging and aggressive behaviour from children. To appeal in particular to digital savvy and young/prospective parents, the production team included members of the popular Bro Town TV series who provided scripts and animation. An advisory group included clinicians, Pasifika public health researchers and early childhood experts. A series of evaluations is planned from 2016.

Science-to-service delays present a dilemma, with calls for more rapid and real-world evidence to match the pace of technology while respecting safety and ethical concerns

A fundamental aspect to the challenge lies in 'science-to- service' or 'evidence-to-practice' delays. Long lead-ins from clinical RCT trialling can see an intervention not fit for roll-out and/or everyday use, if not also overtaken by technological advances[41,80].

There are increasing calls for more real-life feasibility and translational research, with suggestions that funding bodies place more emphasis on this too[79]. As we noted earlier, commercially – and privately-developed digital interventions can also offer important lessons on what works in highly popular tools, even where not evidence-based or evaluated.

Some see an 'impossible dilemma' of evidence (and policymakers) keeping pace with the rate of innovation and constantly moving targets. Alternatives have been mooted for new frameworks for developers as well as evaluators and for acceptable forms of real-world evidence[27,28,30]. A 'rapid and relevant research paradigm', for instance, might involve multiple small-scale experiments among diverse users and settings to progress translation more efficiently than traditional methods[79]. Other suggestions include agile development in which a minimal viable product is shared with end-users and refined in cyclical processes, becoming progressively larger in scale and scientifically rigorous in testing[63].

Notwithstanding security and confidentiality issues, leveraging user data offers a complementary way forward. In any case, a trade-off will likely remain with respecting the principle, especially with e-mental health, of doing no harm before any roll-out. Informed consent, terms of use, confidentiality, privacy and security of information collected from users are important standard concerns.

Uptake has been a challenge at systems as well as human levels – key success factors include adequate connectivity and buy-in from well-supported front-line professionals

Uptake of even well-developed e-therapies has been found to be a challenge at a systems-level as well as at community and individual levels[q]. For a start, intended users may not know they exist. Technical problems, including lack of access to technology and up-to-date connectivity, can be a second major road-block. Inadequate infrastructure has also been found to be a barrier where e-tool use is provided in place-based (agency/community) settings.

Another essential part of formally implementing a tool as part of an existing system involves providing workforce education and training, including technical support, for primary care providers and other appropriate front-line professionals/agency staff to understand (and trouble-shoot) the tool. This can go some way towards off-setting some reported resistance to e-tools.

Expectations that clinicians might be responsive to texts and monitor user data 24/7 also present questions of workload burden, boundaries, competency and duty of care[26,79], requiring guideline and policy development.

> ## Lack of buy-in from front-line professionals is a major barrier
>
> Resistance to use and/or referral of e-therapies by clinicians can be due to:
>
> - poorly understood clinical relevance or practicality[29]
>
> - perceived threat of online services seen as damaging or impeding face-to-face therapeutic relationships[68,79]
>
> - lack of financial incentives (vs. fees for services)[83]
>
> - low confidence in the quality and/or effectiveness.

Quality control is a serious problem and attempts to regulate have been fraught

The web operates as an unregulated open market with no universal standards and an overwhelming number of apps and online tools rapidly appearing... and also disappearing. While some 'lightly' produced online tools are well respected and offer learnings, the lack of quality control presents a major concern for areas such as mental health and parenting support where potential harm can be done.

Efforts to provide some form of quality assurance frameworks, benchmarking and accreditation have been fraught. The UK's NHS Health Apps Library, for example, was intended to provide an official stamp of approval but of the 14 selected e-mental health tools, only four had patient-corroborated evidence of clinical effectiveness and just two had validated performance metrics[72]. The site was

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q. Requiring cross-sector work to embed SPARX and 25 other initiatives, the Prime Minister's Youth Mental Health Project was intended to operate as an 'integrated planning and decision making model'. Superu's formative evaluation (2015) and forthcoming summative report (2016) offer valuable lessons learned by the many parties involved in implementation.

'Build it... and they won't necessarily come (or stay)' – tactics to help uptake and retention

- 👍 Simple sign-up process with optimised accessibility and compatibility for browsers, operating systems and devices (including Chromebooks for schools), allowing offline access too.

- 👍 Promotional materials in appropriate [user and non-user informed] language[61] – ask young people and parents about how and where to deliver and disseminate e-services.

- 👍 Health professional recommendations[20].

- 👍 Motivational interviewing, brief advice[21,53], 'showing rather than telling' and other strategies by primary care providers may help with engagement.

- 👍 Use of persuasive technology, e.g. text prompts, built-in explanations of why the tool might help[63].

- 👍 Celebrity factor – use of well-known figures from popular culture as ambassadors or in the content itself, e.g. Play Kindly and Aunty Dee. 'Ordinary' (more relatable) role models are important too[86].

- 👍 Integrated incentives and rewards, e.g. 'Rockin' routines' and other gaming-inspired badges[30,62,76].

- 👍 Information for friends and family as strong sources of 'wrap-around' support.

- 👍 Leverage the "powerful influence" of 'peer-to-peer enthusiasm'[62(p11)], not discounting the value of local on-the-ground support by communities and agencies as well as social media hype.

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closed down in October 2015, with a 'choices' page offering resources and video clips in its place. A taskforce report (2016) has since recommended this site be strengthened and promoted through social marketing to direct people to effective digital mental health products and services[81].

American FDA guidance on mobile medical apps (2015) allows for enforcement discretion on apps for self-management without specific treatment, including behavioural coping skills for depression and anxiety[82]. But as with other attempts to introduce control, reliance on a developer's intended use provides loopholes and avoidance of responsibility.

For the foreseeable future, the question of systematically adopted quality assurance remains an ongoing challenge.

In the absence of official endorsement of quality and clinical effectiveness by trusted sources, guidance may come from informal channels such as communities of professional practice to recommend or not recommend online programmes or services[27]. Some see a key leadership role for psychologists, with implications for capability as well as capacity[83], and strong clinical governance.

Watch this space...

The many past, present and developing efforts to provide benchmarks and other quality standards include:

- Work by an international group of experts, Collaborating on Maximising the impact of E-therapy and Serious Games (COMETS)

- The Young and Well Cooperative Research Centre's Mobile Application Rating Scale (MARS)

- WHO mobile health (mHealth) evidence reporting and assessment checklist (mERA).

There remains a clear need for guidance for practitioners, funders... and users: If a young person feels too low to get out of bed or a time-poor parent isn't coping, how can they be supported in online help-seeking to find a good tool?

Best practice for government-funded initiatives, at the very least, should include requirements for routine research, monitoring and evaluation, with a focus on continuous improvement. This nevertheless requires significant resource commitments well beyond seed funding, indicating a need for decision-makers to factor in return on investment (giving thought to future ownership and hosting arrangements too[63]).

Calls for mandated cost-benefit analyses, for government subsidies of best e-therapy practices and for collaboration over replication are based in part on lived experiences and wisdom that cost per user is high if there are few users, but low if there are many. It makes sense to use either small number of tools for a large number of people or at least share some things across different publicly-funded programmes and apps, e.g. data/outcomes/safety processes.

Technology offers lots of exciting possibilities but focus needs to remain on best serving users to meet their needs in a realistic and sustainable way

The rapidly emerging next generation of technologies includes advances in ubiquitous 'u-health', virtual reality, ambient intelligence and wearable technology, with skin-responsive sensors enabling unobtrusive data collection ('biofeedback') and potential for even greater in-the-moment interventions...

But before we start getting too excited about the next big shiny thing, we need to give thought to feasibility, funding and sustainability, and – most importantly – what works for best serving users to meet their needs. In other words, it's critical not to lose sight of purpose for which any e-tool is developed.

Effectiveness should be understood in real-world as well as clinical terms: robust testing of interventions with particular regard to [un]intended users, strategies for translation into a 'go-to' service, and ongoing measurement of actual reach and impact, taking into account equity of access and also, where possible, human factors.

From this overview of digitally-delivered youth mental health and parenting support, we need to keep learning about what works and what doesn't from a range of well-placed stakeholders and appropriate sources, including evidence-informed practice and practice-based evidence. This involves open and ongoing conversations based on a shared purpose: better understanding how digital tools can best serve users to promote their wellbeing.

Automated trolling of blogs and Tweets for suicidal thinking is highly contentious

In the UK, a Samaritan-created 'suicide watch' app was withdrawn shortly after public release in 2014 amidst concerns of privacy and false positives. In the interest of trying to save lives, Australia's Black Dog Institute is nevertheless pursuing this line of inquiry, and is also looking to learn from blogs. Early findings from its Ground Truth project have found suicidality possibly indicated by shorter sentences and more first person statements[94]. Facebook launched a suicide prevention tool in June 2016 and is developing user-responsive resources too.

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Our approach

- New Zealand and international peer-reviewed literature was sourced from databases including Ebsco, Scopus, Cochrane, Campbell, Social Care Online and NICE (including PubMed), with support from the Ministry of Social Development Information Services.

- Additional sources included Google Scholar; hand-searched reference lists; selected clearinghouses and other repositories. Grey literature was also sourced directly from government agencies and service/resource providers. Further information was supplied by researchers and developers of e-therapy tools.

- Due to the rapid rate of technology change, search criteria limited results to publication in English from 2012 onwards (unless judged critical), with a core focus on 'effectiveness', 'evidence' and 'efficacy'.

- Out of scope: Use of ICT for diagnostic, administrative, workforce support and transactional purposes (e.g. management of records, telehealth); cessation activities for physical wellbeing; hardware/device specifications; cost-effectiveness; big data; websites and other platforms that are informational only.

Our purpose

To increase the use of evidence by people across the social sector so that they can make better decisions – about funding, policies or services – to improve the lives of New Zealanders, New Zealand's communities, families and whānau.

What we do

We work across the wider social sector to:

- **promote** informed debate on the key social issues for New Zealand, its families and whānau, and increase awareness about what works

- **grow** the quality, relevance and quantity of the evidence base in priority areas

- **facilitate** the use of evidence by sharing it and supporting its use in decision-making.