SUPPLEMENTARY DOCUMENTS

Supplementary Table 1: Identified Unique Terms On De-Adoption Process

1.	Disinvest*	23.	Remov*
2.	Decrease use	24.	Replace
3.	Discontinu*	25.	Refute
4.	Abandon*	26.	Overuse
5.	Reassess*	27.	Stop*
6.	Obsole*	28.	Inappropriate use
7.	Medical reversal	29.	Relinquish*
8.	Contradict	30.	Ineffective
9.	Re-invest	31.	Misuse
10.	Withdraw*	32.	Re-appraisal
11.	Reduc*	33.	Re-prioritization
12.	Decline in use	34.	Substitutional re-investment
13.	Health technology reassessment	35.	Evidence-based reassessment
14.	Change in use	36.	Clinical re-design
15.	De-implement*	37.	Disadoption
16.	De-list	38.	Defunding
17.	Low value practice/intervention	39.	Resource release
18.	Change in practice	40.	Withdrawing from a service and redeploying resources
19.	De-adopt*		
20.	De-commission	41.	Redeploy
21.	Do not do	42.	Reversal
22.	Reallocation	43.	Drop in use

Source : Niven DJ, Mrklas KJ, Holodinsky JK, Straus SE, Hemmelgarn BR, Jeffs LP, et al. Towards understanding the de-adoption of low-value clinical practices: A scoping review. *BMC Med*. 2015;**13**:255.

Supplementary Table 2: The Search String Using Web of Science and Scopus (first round of search was done on 4 February 2021 and repeated on 3 January 2022)

Database	Search string
Web of Science	TS=((“disinvest*” OR “defund*” OR “health technology reassess*” OR “resource reallocation” OR “de-implement*” OR “de-list*” OR “obsolete technolog*” OR “obsolete practi*” OR “evidence-based reassess*” OR “de-commission*” OR “discontinue*” OR “low value practi*” OR “low value technolog*” OR “health technology assessment”) AND (“healthcare” OR “health care”))
Scopus	TITLE-ABS-KEY((“disinvest*” OR “defund*” OR “health technology reassess*” OR “resource reallocation” OR “de-implement*” OR “de-list*” OR “obsolete technolog*” OR “obsolete practi*” OR “evidence-based reassess*” OR “de-commission*” OR “discontinue*” OR “low value practi*” OR “low value technolog*” OR “health technology assessment”) AND (“healthcare” OR “health care”))

Supplementary Table 3: Search Strategy Using OVID Medline (using Boolean operator, phrase searching, truncation, wild card, and MeSH terms)

DATABASE: Ovid MEDLINE(R) and Epub Ahead of Print, In-Process & Other Non-Indexed Citations, Daily and Versions(R) <1990 to February 04, 2021>

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1 Resource Allocation/
2 (allocative adj1 efficiency).tw.
3 (resource adj1 allocation*).tw.
4 disinvest*.tw.
5 discontinu*.tw.
6 reassess*.tw.
7 TECHNOLOGY ASSESSMENT, BIOMEDICAL/
8 biomedical technolog* assessment*.tw.
9 technology assessment*, biomedical.tw.
10 health technolog* assessment*.tw.
11 assessment*, health technolog*.tw.
12 technology assessment*, health.tw.
13 (obsolete adj1 technolog*).tw.
14 (obsolete adj1 practice*).tw.
15 medical reversal*.tw.
16 re-invest*.tw.
17 Health technology reassessment*.tw.
18 De-implement*.tw.
19 De-list*.tw.
20 low value practice*.tw.
21 low value intervention*.tw.
22 de-commission*.tw.
23 re-allocation*.tw.
24 reallocation*.tw.
25 Evidence-based reassessment*.tw.
26 defund*.tw.
27 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22 or 23 or 24 or 25 or 26
28 DELIVERY OF HEALTH CARE/
29 27 and 28
30 limit 29 to (English language and last 20 years)
31 limit 30 to "reviews (best balance of sensitivity and specificity)"

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Supplementary Table 4: The Inclusion and Exclusion Criteria

Criterion	Eligibility	Exclusion
Research type	Review articles	Book series or chapter, primary study, case study, conference proceeding, abstract, poster, technical report (organisational or government policy document), opinion paper, commentary
Language	English	Non-English
Publication date	Between 2001 and February 2021	Published <2001
Review type	Systematic review, scoping review, pragmatic review, overview, interpretative review, critical interpretative synthesis	Narrative review
Components covered in the review	1. Terms and concepts related to disinvestment 2. Description on disinvestment programme, tools or propose new framework 3. Description of “not to do” recommendations, no or low value technologies, practices, or services 4. Methods on decision-making related to disinvestment of health technologies 5. Stakeholder involvement in disinvestment process	1. Description of terms unrelated to disinvestment or health technology reassessment 2. Disinvestment in other field (not healthcare)

Supplementary Table 5: Summary of included reviews on type and number of articles, concepts and terms, purpose of disinvestment, implementation and areas of disinvestment, and new framework proposed for disinvestment or health technology reassessment

Author & publication year	**Review type & number of articles included**	**Clarifying concepts and terms for disinvestment** (Yes / No)	**Purpose of disinvestment**	**Disinvestment implementation** (Local / Country-level / Regional / International / Not specified)	**Areas of disinvestment** (general / pharmaceuticals / non-pharmaceuticals)	**Propose framework for disinvestment / HTR**
Walsh-Bailey et al., 2021	Scoping review of frameworks and models in healthcare, public policy, business fields (n=27)	No	Based on action targets for the interventions (reduce, replace, restrict, and remove)	Not specified	General	No
Mitchell et al., 2021	Systematic review of qualitative studies (n=12)	No	(i) Resource reallocation (ii) Cost-effective spending (iii) Benefits to patients and community	Not specified	Non-pharmaceuticals	No
Embrett et al., 2020	Systematic review of qualitative studies (n=106)	**Yes** - to provide clarity and enhance communication	Resource withdrawal	Not specified	General	No
Esandi et al., 2020	Interpretative review (n=17)	No	(i) Optimisation of care (ii) Resource reallocation	Not specified	General	**Yes** - ATM framework (to guide the strategies in identifying candidates for disinvestment)
Calabrò et al., 2018	Systematic review of deliverables from European HTA organisations (n=10)	No	(i) Sustainability of healthcare system (ii) Availability of new health technologies (iii) Resource constraints	Regional (European HTA agencies)	General	No
Soril et al., 2018	Overview of systematic reviews (n=not mentioned) followed by expert stakeholder consultation	**Yes** - to provide a clearer vision regarding managing existing technologies in the system	For optimal technology use	Not specified	General	**Yes** - a structured 6-questions approach to frame optimal technology use in guiding the HTR

Author & publication year	**Review type & number of articles included**	**Clarifying concepts and terms for disinvestment** (Yes / No)	**Purpose of disinvestment**	**Disinvestment implementation** (Local / Country-level / Regional / International / Not specified)	**Areas of disinvestment** (general / pharmaceuticals / non-pharmaceuticals)	**Propose framework for disinvestment / HTR**
Agirrezabal et al., 2017	Systematic review of published and unpublished articles (n=11) followed by online questionnaire	No	(i) Resource reallocation (ii) Re-investment in health technologies with better value (iii) Sustainability of healthcare system	Regional (Latin America countries)	General	No
Chambers et al., 2017	Systematic review of empirical evaluations of disinvestment initiatives (n=18) and identifying international programmes	No	(i) Invest in higher value care (ii) Increase health care efficiency	International	General	No
Maloney et al., 2017	Systematic literature review (n=40)	**Yes** - the use of more neutral terms, such as "reassessment," could improve stakeholder (clinicians, patients, industry) engagement.	(i) Optimizing the use of a drug technology (ii) Improving the efficiency and quality of health care	International	Pharmaceuticals	No
Orso et al., 2017	Systematic literature review (n=38) with data collection on socio-economic indicators and the existence of HTA agency/ies from countries in OECD, BRICS and Indonesia	No	(i) Resources re-allocation (ii) Supporting policy makers in disinvestment decisions (iii) Improving quality of care (iv) Rationalization of resources	International and Regional (OECD countries, BRICS [Brazil, India, China, South Africa] and Indonesia)	General	No
Seo et al., 2016	Systematic literature review (n=45) followed by interviews with experts from NICE (UK) and Osteba (Spain)	No	(i) Increase the efficiency and quality of care (ii) Enhance the optimal use of health technologies (iii) Value for money/cost-effective	International and Country-specific (UK, Canada, Australia, Spain)	General	**Yes** - HTR process for South Korean

Author & publication year	**Review type & number of articles included**	**Clarifying concepts and terms for disinvestment** (Yes / No)	**Purpose of disinvestment**	**Disinvestment implementation** (Local / Country-level / Regional / International / Not specified)	**Areas of disinvestment** (general / pharmaceuticals / non-pharmaceuticals)	**Propose framework for disinvestment / HTR**
Mayer et al., 2015	Systematic literature review (n=120) followed by questionnaire and interviews with international experts	**Yes** (no specific reason mentioned)	(i) Improve quality of health care and patient safety (ii) Reduction of the waste of resources (iii) Reallocation of resources	International	General	No
Niven et al., 2015	Systematic literature review (n=109)	**Yes** – to provide guide for the de-adoption of services and clinical practices, and directing future research (no clear, established taxonomy for de-adoption)	Resource optimisation	International	General	**Yes** - synthesis model for de-adoption process
Parkinson et al., 2015	Systematic literature review (number of articles included not mentioned)	No	Reallocation to higher value interventions	Country-specific (UK, France, Canada, Australia and New Zealand)	Pharmaceuticals	No
Garner et al., 2013	Selective review of Cochrane systematic reviews - scan the 'implications for practice' section in the authors' conclusions of new or updated Cochrane reviews (n=28)	No	Not mentioned	Not specified (using Cochrane reviews as identification tool for disinvestment)	General	No
Polisena et al., 2013	Systematic literature review of disinvestment case studies (n=14)	No	Resource re-allocation to more beneficial services / programmes	International	General	No

Author & publication year	**Review type & number of articles included**	**Clarifying concepts and terms for disinvestment** (Yes / No)	**Purpose of disinvestment**	**Disinvestment implementation** (Local / Country-level / Regional / International / Not specified)	**Areas of disinvestment** (general / pharmaceuticals / non-pharmaceuticals)	**Propose framework for disinvestment / HTR**
Leggett et al., 2012	Systematic literature reviews (n=36)	**Yes** - to differentiate between "disinvestment" and "health technology reassessment"	(i) Minimise waste and inefficiency (ii) Reduce harms and variation in practice (iii) Maintaining quality of care (iv) Sustainability of health care system (v) Optimal use of technology	International	Non-pharmaceuticals	No

Supplementary Table 6: The main themes and sub-themes for Purpose of Disinvestment

Authors	Value-based spending			Resource re-allocation			Improving quality of health care					Informed policy-making		
	CE	RW	SH	FR	RHT	SR	IB	RNV	OES	VP	IQW	SDP	RR	BG
Walsh-Bailey (2021)		√			√			√						
Mitchell (2021)	√			√			√							
Embrett (2020)						√								
Esandi (2020)				√					√					
Calabrò (2018)			√		√									√
Soril (2018)									√					
Agirrezabal (2017)			√	√	√									
Chambers (2017)					√						√			
Maloney (2017)									√		√			
Orso (2017)				√							√	√	√	
Seo (2016)	√								√		√			
Mayer (2015)		√		√							√			
Niven (2015)									√					
Parkinson (2015)					√									
Polisena (2013)					√									
Leggett (2012)		√	√						√	√	√			

Value-based spending

- CE = Cost-effective spending
- RW = Reduction of the waste
- SH = Sustainability of health care

Resource re-allocation

- FR = Reallocation of freed resource
- RHT = Reinvestment in health technologies
- SR = Shifting resources from one to another

Improving quality of health care

- IB = Increase benefits to patients
- RNV = Remove “no added value” technologies
- OES = Optimum effectiveness and safety
- VP = Reduce variation in practice
- IQW = Improve quality and widen service provision

Informed policy-making

- SDP = Support decision and policy-making
- RR = Rationalization of resource allocation
- BG = Addressing budgetary gaps

Supplementary Table 7: Elements in Identification Process of Disinvestment

Triggers for Identification of Candidates	Implementation of Identification Process
• Presence of new research evidence • Conflicting practice to clinical practice guidelines (CPG) / recommendations • Variations in care / practice • Evidence of public interest or controversies • Harmful to patients (safety issues) • Decreased frequency of use • Low-value interventions / practices • Presence of new technology • Legacy technologies • Leakage / indication creep	• Ad hoc identification method • Embedded identification method • Fixed time for reassessment • Criteria-based identification method • Identification through established methods / frameworks / tools • Efficient, systematic and transparent processes • "One-in-one-out" policy
Source for Identification Process	
• Scientific evidence (Clinical guideline, Cochrane Reviews, HTA reports, literature / publications) • Consultation with experts (clinical specialist, technical advisory committee, programme coordinator) • Administrative record / databases (e.g. utilisation, prescription, adverse events databases)	

Supplementary Table 8: Tools and Criteria in the Prioritization Process

PriTec Prioritization Tool (AVALIA-T)	Other Prioritization Criteria
Domain 1: Population / Users • Burden of disease / disease frequency • Frequency of technology use • Patients preferences **Domain 2: Risk / benefits** • Efficacy / effectiveness / validity • Adverse effects • Risks if de-adoption / disinvestment takes place **Domain 3: Cost / Organisation / Others** • Efficiency • High budget of technology (e.g. maintenance costs)	• Evidence of futility • Promising evidence on existing alternative • Not for vulnerable populations • Small benefits (lack of improvement for health) • Time-based / duration (technology life cycle) • Strength of evidence on lack of efficacy • Using existing tools for priority setting (e.g. tools for HTA / Early Awareness and Alert Systems / Horizon Scanning) • Opportunity cost