

Supplementary Table 1 – Reviewed PPTS implementations. Letters a-t refer to study reviewed (please see below for the complete list). Numbers 1-6 in the first column indicate elements of a PPTS (derived from [u]). Countries are sorted based on the income level of countries according to the United Nations Development Program (<http://hdr.undp.org/en/content/income-index>), with the four highest in table 1a, the middle four in table 1b, and the lowest in table 1c.

Supp. table 1a	USA	Germany	Denmark	UK
Implementation status	Requirements implemented in 29 states, 6 states have pending legislation [a]; Implementation varies between states and hospitals [b,c].	Cross- country study, not yet nationally implemented [h].	Coding is implemented [i]; using the codes is not implemented [j].	Pilot in a hospital [k].
Level of success	The pilots and partial implementation show various levels of success, but the fact that no overarching, national system is in place does not indicate great success.	Promising results, implementation seems beneficial [h].	The current system is functioning, but not up to EU standards [i,j].	No promising results; many SFMP remained unidentified [k].
1. A unique code	RFID is the most frequently mentioned method of serialisation [a-f].	RFID-tags [h].	Barcodes on all prescription medicines [j].	2D barcodes and authentication logo for pharmacies [k].
2. Packaging requirements		Attached to “the products” [h].	On “each package of medicine” [j].	
3. A scanning device	RFID- readers [d,f].	RFID readers in the form of a specialised terminal, also able to perform bulk readings [h].	Scanning is not yet implemented [j]; data is inserted manually [i].	Scanning [k].
4. A central database	No national, overarching system, but in some pilots, databases used to store information and allows correspondence [c,g].	Central database ‘The Pharmaceutical Trust Center’ [h].	In the future: an EU-wide database [j]; now there is a national database [i].	
5. A cross-checking system		Medical product can be shipped when products are serialised and stored in the database [h].		
6. A warning/ disabling function	In one pilot, discrepancies are reported to the distributor [g]			

Supp. table 1b	Hong Kong	Poland	Turkey	Iran
Implementation status	Case studies, no national implementation [l,m].	Nothing implemented, but awareness is raised [n].	Implemented throughout the supply chain [o-q].	Research, nothing implemented [r].
Level of success	Promising results but no further implementation [l,m].		Very successful [o-q].	
1. A unique code	RFID-tags [l,m].		2D datamatrix [o,q].	
2. Packaging requirements	Tag inside “each product package” [l].		A code on every secondary and tertiary packaging [o].	
3. A scanning device	Scanning with RFID reader [l].		Datamatrix scanner for supply chain actors and mobile application for patients [o].	
4. A central database	Global sharing mechanism [l,m].		Central database [o].	
5. A cross-checking system	Messages between supply chain parties must match [l].		Sales- and purchasing notifications are compared to cross-check movements [o].	
6. A warning/disabling function	An alert is provided in the event of unsuccessfully matched information [l].		Completing a sale is not possible when the notifications do not match and a warning is sent to the Ministry of Health [o].	

<b>Supp. table 1c</b>	<b>Taiwan</b>	<b>India</b>	<b>Pakistan</b>	<b>Ethiopia</b>
Implementation status	Partial implementation: in limited number of hospital and in early adoption stage [s].	Only implemented for exported drugs [t]; implementation attempts [a].	Pilot [u].	Pilot [u].
Level of success	Hesitation for further implementation [s].		No promising results as data were not captured properly [u].	Promising results, but no implementation [u].
1. A unique code	RFID-tags [s].	1D or 2D barcodes [a].	2D barcodes [u].	Barcodes [u].
2. Packaging requirements		Code on primary, secondary and tertiary packaging levels [a].	Code on secondary packages [u].	Code on secondary packages [u].
3. A scanning device	RFID reader with software application [s].		Handheld scanners [u].	Mobile application using telephone camera [u].
4. A central database	Back-end application that stores information [s].	No database [t].		National database [u].
5. A cross-checking system			Web- interface with global information [u].	Real-time validation and cross-referencing [u].
6. A warning/disabling function				

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