

### Supplementary file 12: Recalls and alerts of poor quality sartans due to impurities in 2018, 2019 and 2020

Continent	Country	API	Number of products-Manufacturers	No. Batches	Month & Year	Ref
<b>Africa</b>	Nigeria	Valsartan	7 products – Dexcel Pharm Limited Actavis Group PTC EHF	-	Aug 2018	[1]
	Ghana	Valsartan	Denk Pharma, Germany	-	Dec 2018	[2]
		Valsartan	2 products from Actavis, United Kingdom, 2 products from Torrent Pharmaceuticals Ltd, India	All	Sep 2018	[3]
	South Africa	Valsartan	3 product -Pharma Dynamic company	All	Jul 2018	[4]
<b>Americas</b>	United States	Valsartan	8 products from AvKARE, Inc. (Hetero/Camber), Solco Healthcare LLC. (Prinston	All	2019	[5]
		Valsartan products	Many companies	698	2019	[5]
		Losartan products	Many companies	445	2019	[5]
		Irbesartan , Telmisartan, Olmesatan products	Many companies	45 65 7	2019	[5] [6]
		Valsartan products	Torrent Pharmaceuticals Limited Teva Pharmaceutical USA Aurobindo Pharma Limited	119 80 22	2020	[7] [8] [9]
		Valsartan products	Camber Pharmaceuticals, Inc	All	2020	[10]
	Canada	Valsartan	Many companies	16	Jul2018	[11]
		Losartan		53	Nov2018	[12]
		Irbesartan		1		[13]
	<b>Asia</b>	India	Losartan, Valsartan, Telmisartan	Many companies	7	Aug2013 Nov2018
Valsartan			2 products –Silom Medical 3 products- Unison Laboratories	All	2018	[15]
Thailand		Losartan	2 product-Berlin Pharmaceutical Industry Company (Lanzaar 50 and 100)	142	Mar2019	[16]
Vietnam		Valsartan	32 products from Vietnam’s companies and 25 imported products	All	Aug 2018	[17]
Hong-Kong		Valsartan	5 products- Actavis and HK Medical companies	-	July 2018	[18]
<b>Europe</b>	Denmark	Valsartan	2Care4 Medical Ltd	6	Jul2018	[19]
		Valsartan- HCTZ	Orifarm Group A/SStada Arzneimittel AG	20	Jul2018	[19]
	France	Irbesartan	Cristers Laboratoire Mylan Pharmaceuticals Zydus Cadila	17	2019	[20]
		Irbesartan- HCTZ <sup>a</sup>	Arrow Génériques Zydus Cadila	10	2019	[20]
	Losartan	Accord Healthcare	1	2019	[20]	

	Valsartan-ALP	Teva pharmaceutical, France	59	2019	[20]
United Kingdom	Valsartan	5 products-Mylan company	All	2018	[21]
		3 products-DEXCEL PHARMA LIMITED	batches		[22]
		4 products- ACTAVIS GROUP PTC EHF Teva UK Limited			
	Valsartan-HCTZ	1 product- ACTAVIS GROUP PTC EHF 3 products-Teva UK Limited	All batches 21 batches	Nov2018	[23]
	Irbesartan	Actavis Group PTC EHF	2 batches	Jan-Feb 2019	[24]
		Macleods Pharma UK Limited	3 batches		[25]
	Irbesartan-HTCZ	Actavis Group PTC EHF	5 batches		[26]
	Losartan	Accord Healthcare Limited	3 batches	Mar2019	[27]
<b>Multicoun try</b>	24 countries *	Valsartan	Unstated	2300 batches	Jul2018 [28]

\* *Germany, Norway, Finland, Sweden, Hungary, The Netherlands, Austria, Ireland, Bulgaria, Italy, Spain, Portugal, Belgium, France, Poland, Croatia, Lithuania, Greece, Canada, Bosnia and Herzegovina, Bahrain, and Malta*

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