
Supplementary Tables and Figures

**Strategies to maximize available resources for
improving radiotherapy accessibility in the post
COVID-19 era : An analysis for Asia**

Supplementary Table 1: Modification of the usual time, dose and fractionation with a hypofractionation radiotherapy (HFRT) schedule and its implications on the early and late effects and the weeks gained to treat additional patients in a year

Standard fractionations prescribed in routine treatments					Corresponding mild to moderate hypofractionated schedules					
% patients	Number*	Schedule	BED (Early) [†] (Gy ₁₀)	BED (Late) [‡] (Gy ₃)	Schedule	BED (Early) [†] (Gy ₁₀)	BED (Late) [‡] (Gy ₃)	Weeks gained / year	Additional patients treatable / year	Total patients treatable / year
30	150	70 Gy / 35 fr / 7 wks	72.5	116.7	70 Gy / 30 fr / 6 wks	77.9	124.2	150	+25	175
30	150	60 Gy / 30 fr / 6 wks	63.7	100.0	60 Gy / 25 fr / 5 wks	69.3	108.0	150	+30	180
20	100	50 Gy / 25 fr / 5 wks	54.9	83.3	50 Gy / 20 fr / 4 wks	60.7	91.7	100	+25	125
10	50	30 Gy / 10 fr / 2 wks	43.6	60.0	30 Gy / 10 fr / 2 wks	43.6	60.0	-	-	50
10	50	<20 Gy / 5 fr / 1 wk	-	-	1- 5 fractions/wk	-	-		0-200 [§]	>50

*Number of patients being treated with standard fractionations assuming radiotherapy to 500 patients/year/teleradiotherapy unit

[†]Biologically effective dose, BED (Early) = $nd + 1 + d/(\alpha/\beta) - (0.693/\alpha) \times (T - T_k)/T_{pot}$, where “n” is the number of fractions, “d” dose/fraction, “T”, the overall treatment time and assuming $\alpha/\beta = 10$ Gy, $\alpha = 0.3$ Gy⁻¹, potential doubling time, $T_{pot} = 5$ days, and kick-off time, $T_k = 21$ days

[‡]Biologically effective dose, BED (Late) = $nd + 1 + d/(\alpha/\beta)$, where “n” is the number of fractions, “d” the dose/fraction and assuming $\alpha/\beta = 3$ Gy

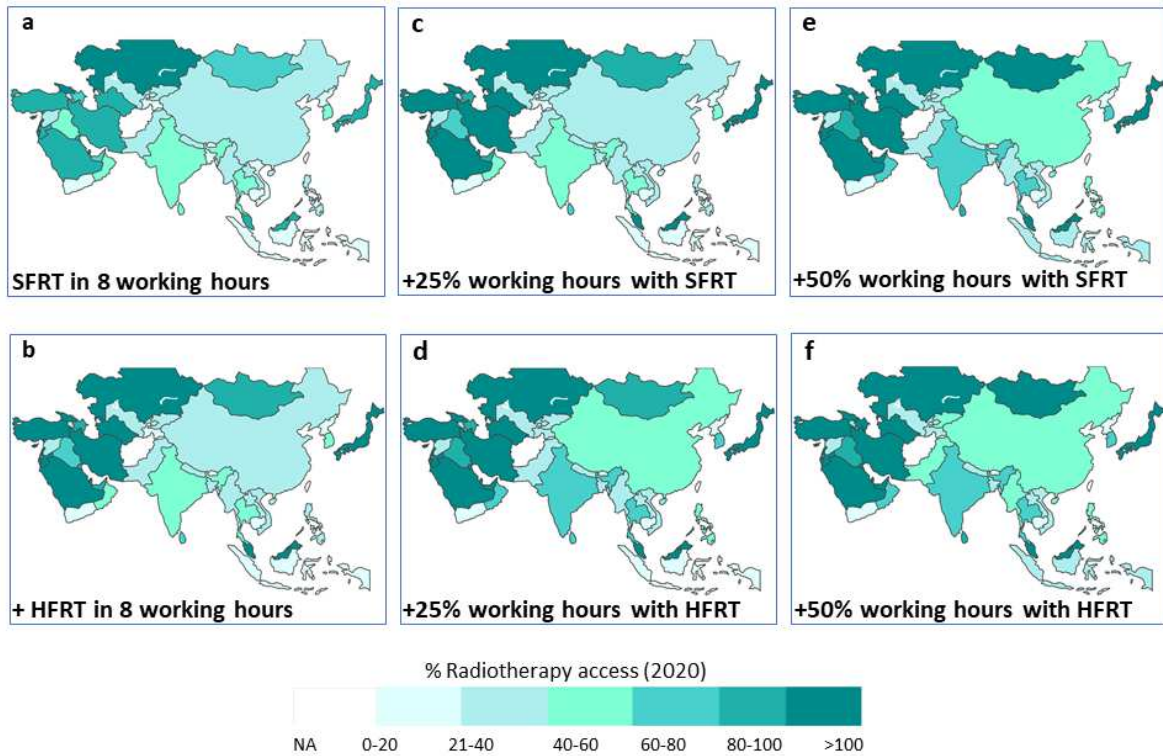
[§] Additional patients would be dependent on the number of fractions used and has been assumed to vary from 1 – 5 fractions/week

Supplementary Table 2: Cancer incidence for 2020 (from GLOBOCAN), radiotherapy infrastructure (from DIARC, IAEA) (2020) and GNI/capita¹ (Atlas method for various countries from The World Bank) (2018) for various countries in Asia.

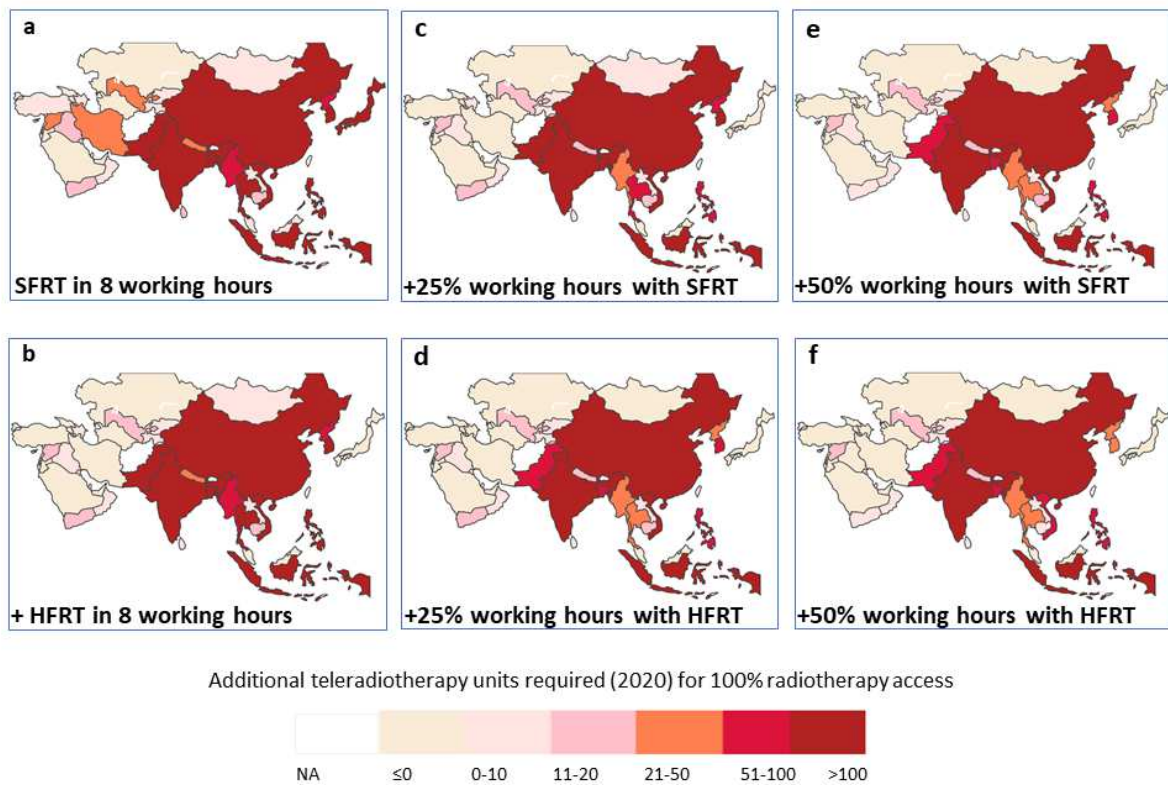
Countries	Cancer incidence (2020)	Radiotherapy infrastructure (2020)			GNI/capita (2018) (in US\$)
		TRT (MV) units	Particle therapy unit	Brachytherapy unit	
Afghanistan	20866	NA	NA	NA	550
Armenia	9099	3	0	1	4230
Azerbaijan	12314	10	0	1	4050
Bahrain	1168	2	0	0	21890
Bangladesh	160433	35	0	8	1750
Bhutan	626	NA	NA	NA	2970
Brunei	993	2	0	0	29660
Cambodia	16359	2	0	1	1390
China	4514447	1644	3	8	9460
Cyprus	5083	7	0	2	28570
DPR, Korea	57714	3	0	0	NA
Georgia	9451	16	0	3	4450
Hong Kong	NA	49	0	8	50300
India	1219884	638	1	314	2020
Indonesia	368698	60	0	15	3840
Iran, Islamic Republic of	117676	121	0	14	5470
Iraq	27176	19	0	0	5040
Israel	28083	34	0	10	40930
Japan	904856	942	21	224	41310
Jordan	11612	14	0	1	4200
Kazakhstan	35382	45	0	18	8080
Kuwait	3968	4	0	1	34290
Kyrgyzstan	6941	2	0	1	1220
Lao People's Democratic Republic	8203	2	0	0	2450
Lebanon	17926	23	0	3	7920
Macao	NA	2	0	1	79110

Countries	Cancer incidence (2020)	Radiotherapy infrastructure (2020)			GNI/capita (2018) (in US\$)
		TRT (MV) units	Particle therapy unit	Brachytherapy unit	
Malaysia	46873	54	0	11	10590
Maldives	457	NA	NA	NA	9280
Mongolia	6028	5	0	1	3660
Myanmar	73219	21	0	7	1310
Nepal	27533	7	0	3	970
Oman	3653	2	0	1	15140
Pakistan	184520	57	0	14	1590
Palestine	NA	NA	NA	NA	NA
Philippines	149342	51	0	15	3830
Qatar	1419	3	0	1	61150
Saudi Arabia	26634	32	0	9	21600
Singapore	28661	23	0	6	58770
South Korea	292699	160	2	42	30620
Sri Lanka	24559	16	0	3	4060
Syrian Arab Republic	24839	7	0	2	NA
Taiwan	NA	75	1	20	NA
Tajikistan	5966	1	0	1	1010
Thailand	179548	101	0	28	6610
Timor-Leste	690	NA	NA	NA	1810
Turkey	223255	266	0	31	10420
Turkmenistan	6194	7	0	4	6740
United Arab Emirates	5392	5	0	1	40880
Uzbekistan	27105	7	0	2	2020
Viet Nam	174636	37	0	10	2360
Yemen	14073	1	0	0	NA

TRT (MV): Megavoltage teleradiotherapy unit



Supplementary Fig. 1 Changes in the % radiotherapy access in categories of 1-20%, 21-40%, 41-60%, 61-80%, 81-100% and >100% for various strategies. The data represents 43 target countries.



Supplementary Fig. 2 Changes in the additional teleradiotherapy units (TRT) in categories of ≤0, 1-10, 11-20, 21-50, 51-100 and >100 for various strategies. The data represents 43 target countries