

## Appendix A: Principal component analysis results

**Table S1 Factor loading matrix(outpatients)**

Items	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Sex	-0.009(-0.003)	-0.047(-0.021)	-0.057(-0.034)	0.275(0.23)	0.914(0.873)
Occupation	0.05(0.015)	0.166(0.074)	0.73(0.433)	0.222(0.186)	0.12(0.114)
Age (years)	0.035(0.01)	0.845(0.378)	-0.005(-0.003)	-0.13(-0.109)	-0.142(-0.136)
Monthly income (RMB <sup>a</sup> )	-0.084(-0.025)	0.201(0.09)	0.792(0.469)	0.174(0.145)	-0.108(-0.103)
Marital status	0.045(0.014)	0.719(0.321)	0.314(0.186)	-0.096(-0.08)	0.125(0.119)
Educational level	-0.074(-0.022)	-0.642(-0.287)	0.348(0.206)	0.149(0.125)	-0.272(-0.259)
Self-rated health status	0.117(0.035)	0.639(0.285)	-0.185(-0.11)	0.082(0.068)	-0.063(-0.06)
Burden of health expenditures	0.184(0.055)	0.287(0.128)	-0.469(-0.278)	0.227(0.19)	-0.109(-0.104)
Whether community health institutions advocated dual practice policy in your current community	0.4(0.12)	0.064(0.029)	-0.088(-0.052)	0.661(0.553)	-0.165(-0.157)
Whether dual practice could reduce difficulty in consulting a doctor	0.689(0.207)	-0.015(-0.007)	-0.081(-0.048)	0.373(0.312)	-0.031(-0.03)
Whether dual practice could meet patient demand for health convenience	0.7(0.21)	-0.047(-0.021)	-0.019(-0.011)	0.281(0.235)	-0.071(-0.068)
Whether dual practice could meet patient demand for treatment for minor illness	0.789(0.237)	-0.067(-0.03)	0.081(0.048)	-0.155(-0.13)	0.014(0.014)
Whether dual practice could meet patient demand for treatment for chronic disease	0.712(0.214)	-0.061(-0.027)	0.038(0.022)	-0.288(-0.241)	-0.033(-0.031)
Whether community health services were your first choice for treatment for minor illness if community health centers engaged in dual practice	0.702(0.211)	-0.138(-0.062)	0.108(0.064)	-0.291(-0.243)	0.149(0.142)
Whether community health services were your first choice for treatment for chronic disease if community health centers engaged in dual practice	0.72(0.216)	-0.023(-0.01)	0.122(0.072)	-0.295(-0.247)	0.063(0.06)
Initial Eigenvalues	3.331	2.239	1.689	1.195	1.048

Percentage of variance (%)	22.210	14.928	11.257	7.965	6.985
Cumulative percentage of variance (%)	22.210	37.137	48.395	56.359	63.344

**Notes:** Extraction method: principal component analysis. Data shown as Eigenvalues (coefficient). <sup>a</sup>RMB, RenMinBi Yuan.

**Table S2 Factor loading matrix(medical staff)**

Items	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Sex	-0.016(-0.004)	-0.004(-0.002)	-0.047(-0.033)	0.762(0.694)	0.046(0.043)
Age (years)	-0.051(-0.014)	0.208(0.128)	-0.053(-0.037)	-0.498(-0.453)	0.604(0.568)
Educational level	0.346(0.094)	-0.174(-0.107)	0.45(0.316)	-0.235(-0.214)	-0.287(-0.27)
Title	-0.28(-0.076)	0.506(0.311)	-0.471(-0.331)	-0.173(-0.158)	-0.313(-0.294)
Technical position	0.325(0.088)	-0.559(-0.343)	0.47(0.33)	0.063(0.058)	0.227(0.213)
Department	-0.076(-0.021)	0.358(0.22)	-0.065(-0.046)	0.329(0.299)	0.548(0.516)
The willingness to join in dual practice	-0.631(-0.171)	0.082(0.05)	0.238(0.168)	-0.049(-0.044)	0.127(0.12)
Whether hospital administrators advocated dual practice policy in your current workplace	-0.333(-0.09)	0.249(0.153)	0.552(0.388)	0.087(0.08)	0.052(0.049)
Whether respondents possessed the knowledge of dual practice policy	-0.311(-0.084)	0.526(0.323)	0.319(0.224)	0.195(0.178)	-0.236(-0.222)
Whether dual practice increased work-related burden	-0.167(-0.045)	0.392(0.241)	0.512(0.36)	-0.113(-0.103)	-0.169(-0.159)
Whether dual practice could reduce difficulty in consulting a doctor	-0.44(-0.119)	0.219(0.135)	0.177(0.125)	-0.086(-0.078)	0.225(0.211)
Support from the hospital	0.812(0.22)	0.24(0.147)	0.079(0.056)	-0.016(-0.015)	0.084(0.079)
Whether hospitals' human resource management system permit free flow of medical staff	0.835(0.226)	0.263(0.162)	0.062(0.044)	-0.02(-0.018)	0.04(0.038)
The willingness of medical staff	0.768(0.208)	0.326(0.2)	0.044(0.031)	0.052(0.048)	-0.025(-0.023)
Existence of a professional dual-practice team	0.78(0.211)	0.278(0.171)	-0.003(-0.002)	0.021(0.019)	0.03(0.029)

Initial Eigenvalues	3.695	1.627	1.422	1.098	1.063
Percentage of variance (%)	24.632	10.846	9.48	7.321	7.086
Cumulative percentage of variance (%)	24.632	35.478	44.958	52.279	59.364

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**Notes:** Extraction method: principal component analysis. Data shown as Eigenvalues (coefficient).

## **Appendix B: Questionnaires**

### **Questionnaire 1: Perception of outpatients of dual practice**

Dear Sir / Madam:

Dual practice is defined as a physician's performance of medical activities in different health institutions (two or more) simultaneously. The aim of this survey was to examine the perception of outpatients of dual practice. The questionnaire information was only for academic research, without involving any commercial interests. All personal information was anonymized prior to analysis. Place a tick in the appropriate box, every question has a single answer. Thank you very much for your support and cooperation!

Q1. Your sex:            ☐Male            ☐Female

Q2. Your occupation:

☐Student    ☐Factory worker    ☐Farmer    ☐Retiree    ☐Civil servant

☐Medical personnel    ☐Military personnel    ☐Others

Q 3. Your age (years) :

☐18-20    ☐20-30    ☐30-40    ☐40-50    ☐50-60    ☐≥60

Q4. Your monthly income (RenMinBi Yuan):

☐0    ☐1-2000    ☐2001-3000    ☐3001-5000    ☐5001-8000

☐8001-15,000    ☐15,001-50,000    ☐>50,000

Q5. Your marital status:

☐Single    ☐Married    ☐Widowed    ☐Others

Q 6. Your educational level:

☐Primary school    ☐Junior high school    ☐Senior high school

☐Junior college    ☐Bachelor    ☐Master    ☐Doctor

Q 7. Your self-rated health status:

☐Very poor   ☐ Poor   ☐Ordinary   ☐Healthy   ☐Very healthy

Q 8. Whether the burden of health expenditures is affordable?

☐Completely affordable   ☐Affordable   ☐Can not affordable

Q 9. Whether community health institutions advocated dual practice policy in your current community?

☐ Yes   ☐ No   ☐ Not certain

Q 10. Whether dual practice could reduce difficulty in consulting a doctor ?

☐ Yes   ☐ No   ☐ Not certain

Q 11. Whether dual practice could meet patient demand for health convenience ?

☐ Yes   ☐ No   ☐ Not certain

Q 12. Whether dual practice could meet patient demand for treatment for minor illness ?

☐ Yes   ☐ No   ☐ Not certain

Q 13. Whether dual practice could meet patient demand for treatment for chronic disease ?

☐ Yes   ☐ No   ☐ Not certain

Q 14. Whether community health services were your first choice for treatment for minor illness if community health centers engaged in dual practice ?

☐ Yes   ☐ No   ☐ Not certain

Q 15. Whether community health services were your first choice for treatment for chronic disease if community health centers engaged in dual practice ?

☐ Yes   ☐ No   ☐ Not certain

## **Questionnaire 2: Perception of medical staff of dual practice**

Dear Sir / Madam:

Dual practice is defined as a physician's performance of medical activities in different health institutions (two or more) simultaneously. The aim of this survey was to examine the perception of medical staff of dual practice. The questionnaire information was only for academic research, without involving any commercial interests. All personal information was anonymized prior to analysis. Place a tick in the appropriate box, every question has a single answer. Thank you very much for your support and cooperation!

Q1. Your sex:            ☐Male            ☐Female

Q2. Your age (years) :

☐18-20    ☐20-30    ☐30-40    ☐40-50    ☐50-60    ☐≥60

Q 3. Your Educational level:

☐Junior college   ☐Bachelor   ☐Master   ☐Doctor   ☐Post-doctorate   ☐Others

Q 4. Your title:

☐Hospital leader   ☐Department leader   ☐Clinical department director

☐Medical-technical department director   ☐Pharmacy director   ☐Doctor

☐Researcher   ☐Others

Q 5. Your technical position:

☐Junior    ☐Intermediate    ☐Vice senior    ☐Senior

Q 6. Your department:

☐Surgical department   ☐Internal medical department   ☐Medical-technical department

☐Others

Q 7. Whether hospital administrators advocated dual practice policy in your current workplace ?

☐ Yes    ☐ No    ☐ Not certain

Q 8. Do you want to join in dual practice?

☐ Yes    ☐ No    ☐ Not certain

Q 9. Do you possessed the knowledge regarding dual practice policy?

☐ Yes    ☐ No

Q 10. Whether dual practice would increase your work-related burden ?

☐ Yes    ☐ No    ☐ Not certain

Q 11. Whether dual practice could reduce difficulty in consulting a doctor ?

☐ Yes    ☐ No    ☐ Not certain

Q 12. The important levels regarding the influencing factors of dual practice

Q 12.1 Support from the hospital

☐very unimportant    ☐unimportant    ☐general    ☐important    ☐very important

Q 12.2 Whether hospitals' human resource management system permit free flow of medical staff

☐very unimportant    ☐unimportant    ☐general    ☐important    ☐very important

Q 12.3 The willingness of medical staff

☐very unimportant    ☐unimportant    ☐general    ☐important    ☐very important

Q 12.4 Existence of a professional dual-practice team

☐very unimportant    ☐unimportant    ☐general    ☐important    ☐very important

### Appendix C: Multinomial logistic regression analysis results of medical staff

Table S3 Comparison of medical staff who was uncertain about the willingness to join in dual practice with medical staff who wanted to join in dual practice <sup>a</sup>

Variables	Parameter	Estimate	SE	Wald $\chi^2$	P-value	OR	95% CI	
							Lower	Upper
Age (years)	Intercept	16.790	1837.988	0.000	0.993			
	18-20	-0.106	4819.495	0.000	1.000	0.900		
	20-30	-18.160	1837.987	0.000	0.992	0.000		
	30-40	-18.365	1837.987	0.000	0.992	0.000		
	40-50	-18.764	1837.987	0.000	0.992	0.000		
	50-60	-17.546	1837.987	0.000	0.992	0.000		
	≥60	Reference						
Educational level	Others	0.197	0.981	0.040	0.841	1.218	0.178	8.333
	Junior college	-0.557	1.197	0.216	0.642	0.573	0.055	5.982
	Bachelor	-0.077	0.339	0.051	0.821	0.926	0.477	1.800
	Master	-0.816	0.328	6.177	0.013*	0.442	0.233	0.842
	Doctor	Reference						
Title	Others	-3.165	2.079	2.317	0.128	0.042	0.001	2.484
	Doctor	-3.566	1.986	3.226	0.072	0.028	0.001	1.384
	Medical-technical department director	-3.054	2.646	1.332	0.248	0.047	0.000	8.429
	Clinical department director	-2.830	2.073	1.864	0.172	0.059	0.001	3.431
	Hospital leader	Reference						
Technical position	Junior	1.334	0.722	3.410	0.065	3.795	0.921	15.631
	Intermediate	1.040	0.707	2.163	0.141	2.829	0.708	11.311
	Vice senior	0.674	0.692	0.949	0.330	1.961	0.506	7.606
	Senior	Reference						
Department	Others	0.055	0.408	0.018	0.893	1.056	0.475	2.351
	Medical-technical department	0.142	0.514	0.077	0.782	1.153	0.421	3.156
	Internal medical department	0.469	0.280	2.808	0.094	1.598	0.924	2.766
	Surgical department	Reference						
Whether hospital administrators	Not certain	1.461	0.375	15.177	0.000*	4.308	2.066	8.983



advocated dual practice policy in the current workplace	No	-0.051	0.434	0.014	0.906	0.950	0.406	2.223
	Yes	Reference						
Whether respondents possessed the knowledge of dual practice policy	No	0.565	0.362	2.437	0.119	1.760	0.866	3.578
	Yes	Reference						
Whether dual practice increased work-related burden	Not certain	0.428	0.306	1.964	0.161	1.535	0.843	2.794
	No	0.029	0.310	0.009	0.925	1.030	0.561	1.889
	Yes	Reference						
Whether dual practice could reduce difficulty in consulting a doctor	Not certain	1.340	0.284	22.255	0.000*	3.820	2.189	6.667
	No	0.566	0.324	3.053	0.081	1.761	0.933	3.324
	Yes	Reference						
Support from the hospital	Very unimportant	2.912	1.172	6.171	0.013*	18.396	1.849	183.042
	Unimportant	2.062	1.113	3.433	0.064	7.861	0.888	69.629
	General	1.145	0.459	6.217	0.013*	3.142	1.278	7.728
	Important	0.425	0.365	1.358	0.244	1.530	0.748	3.127
	Very important	Reference						
Whether hospitals' human resource management system permit free flow of medical staff	Very unimportant	-0.178	1.526	0.014	0.907	0.837	0.042	16.654
	Unimportant	0.545	1.024	0.283	0.595	1.724	0.232	12.843
	General	1.140	0.514	4.930	0.026*	3.127	1.143	8.557
	Important	1.003	0.384	6.822	0.009*	2.726	1.284	5.786
	Very important	Reference						
The willingness of medical staff	Very unimportant	-0.300	1.674	0.032	0.858	0.741	0.028	19.720
	Unimportant	2.295	1.144	4.024	0.045*	9.926	1.054	93.456
	General	0.498	0.503	0.982	0.322	1.646	0.615	4.408
	Important	0.452	0.396	1.308	0.253	1.572	0.724	3.413
	Very important	Reference						
Existence of a professional dual-practice team	Very unimportant	16.018	2092.200	0.000	0.994	9044237.632		
	Unimportant	0.010	1.092	0.000	0.993	1.010	0.119	8.579
	General	-0.208	0.519	0.161	0.688	0.812	0.294	2.244
	Important	-0.402	0.399	1.016	0.313	0.669	0.306	1.462
	Very important	Reference						

Notes: \*P,0.05 (two sided). \*Reference: medical staff who wanted to join in dual practice.

Abbreviations: OR, odds ratio; SE, standard error; CI, confidence interval.

Table S4 Comparison of medical staff who was opposed to joining in dual practice with medical staff who wanted to join in dual practice <sup>a</sup>

Variables	Parameter	Estimate	SE	Wald $\chi^2$	P-value	OR	95% CI	
							Lower	Upper
Age (years)	Intercept	-17.141	6041.594	0.000	0.998			
	18-20	-0.976	0.000			0.377	0.377	0.377
	20-30	-1.972	4649.581	0.000	1.000	0.139		
	30-40	-1.353	4649.581	0.000	1.000	0.258		
	40-50	-1.130	4649.581	0.000	1.000	0.323		
	50-60	-0.680	4649.581	0.000	1.000	0.507		
	≥60	Reference						
Educational level	Others	0.165	1.218	0.018	0.892	1.179	0.108	12.823
	Junior college	-0.239	1.798	0.018	0.894	0.787	0.023	26.690
	Bachelor	0.522	0.464	1.266	0.261	1.686	0.679	4.185
	Master	-0.469	0.462	1.029	0.310	0.626	0.253	1.548
	Doctor	Reference						
Title	Others	15.171	3857.753	0.000	0.997	3878293.445		
	Doctor	13.823	3857.753	0.000	0.997	1007644.662		
	Medical-technical department director	16.931	3857.753	0.000	0.996	22538965.979		
	Clinical department director	13.625	3857.753	0.000	0.997	826604.458		
	Hospital leader	Reference						
Technical position	Junior	0.349	0.913	0.146	0.702	1.418	0.237	8.484
	Intermediate	0.173	0.890	0.038	0.846	1.189	0.208	6.797
	Vice senior	0.408	0.883	0.213	0.644	1.503	0.266	8.483
	Senior	Reference						
Department	Others	0.186	0.573	0.105	0.746	1.204	0.391	3.704
	Medical-	0.234	0.672	0.121	0.727	1.264	0.338	4.723

	technical department							
	Internal medical department	0.791	0.390	4.116	0.042*	2.206	1.027	4.736
	Surgical department	Reference						
Whether hospital administrators advocated dual practice policy in the current workplace	Not certain	0.085	0.511	0.027	0.868	1.088	0.400	2.963
	No	1.315	0.489	7.231	0.007*	3.724	1.428	9.710
	Yes	Reference						
Whether respondents possessed the knowledge of dual practice policy	No	0.508	0.442	1.319	0.251	1.662	0.698	3.954
	Yes	Reference						
Whether dual practice increased work-related burden	Not certain	-0.311	0.416	0.561	0.454	0.732	0.324	1.654
	No	-0.688	0.391	3.096	0.079	0.503	0.233	1.082
	Yes	Reference						
Whether dual practice could reduce difficulty in consulting a doctor	Not certain	1.226	0.414	8.752	0.003*	3.406	1.512	7.673
	No	1.506	0.389	14.971	0.000*	4.508	2.102	9.667
	Yes	Reference						
Support from the hospital	Very unimportant	0.171	1.416	0.015	0.904	1.187	0.074	19.033
	Unimportant	-0.335	1.503	0.050	0.824	0.716	0.038	13.625
	General	0.057	0.618	0.008	0.927	1.058	0.315	3.551
	Important	0.410	0.468	0.769	0.381	1.507	0.603	3.768
	Very important	Reference						
Whether hospitals' human resource management system permit free flow of medical staff	Very unimportant	2.342	1.543	2.305	0.129	10.401	0.506	213.865
	Unimportant	3.610	1.108	10.609	0.001*	36.956	4.211	324.347
	General	2.102	0.660	10.145	0.001*	8.185	2.245	29.840
	Important	1.246	0.507	6.032	0.014*	3.475	1.286	9.388
	Very important	Reference						
The willingness of medical staff	Very unimportant	0.608	1.554	0.153	0.696	1.837	0.087	38.599
	Unimportant	1.984	1.177	2.839	0.092	7.270	0.723	73.057
	General	-0.397	0.612	0.422	0.516	0.672	0.202	2.231

	Important	-0.110	0.487	0.051	0.822	0.896	0.345	2.327
	Very important	Reference						
Existence of a professional dual-practice team	Very unimportant	-2.196	5167.744	0.000	1.000	0.111		
	Unimportant	-0.666	1.266	0.277	0.599	0.514	0.043	6.146
	General	-0.696	0.602	1.337	0.248	0.499	0.153	1.622
	Important	-0.766	0.472	2.639	0.104	0.465	0.184	1.171
	Very important	Reference						

Notes: \*P,0.05 (two sided). <sup>a</sup>Reference: medical staff who wanted to join in dual practice.

Abbreviations: OR, odds ratio; SE, standard error; CI, confidence interval.