



www.atmpmanufacture.org

Manufacturing Challenges of ATMPs

PharmSci Conference 11 Sep 2019

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- ATMP background and market environment
- The amc (ATMP Manufacturing Community)
- Manufacturing Challenges
 - Growth
 - Capacity
 - Skills
 - Technologies
 - CoGs
- What's next?



Background and market environment



“Gene therapy is the introduction of genetic material into patients with an intended curative, life extending or life-enhancing therapeutic benefit.”

- In vivo gene therapy eg treating LCA via RPE65 delivered by AAV
- Ex vivo gene therapy eg treating ALL using T-cells modified by viral vector to produce Chimeric Antigen Receptors to target CD19 cancer cells



- Gene Therapy Marketing Authorisations:
 - Strimvelis (ADA-SCID) – GSK now Orchard Therapeutics
 - Imlygic (melanoma) - Amgen
 - Kymriah (ALL) - Novartis
 - Yescarta (non Hodgkin Lymphoma) – Kite Pharma now Gilead
 - Luxturna (inherited retinal disease) – Spark Therapeutics
- >2500 clinical trials to date
- 372 in progress in Q1 2019
 - Phase I 123
 - Phase II 217
 - Phase III 32



- Interest from big pharma in 2019
 - Catalent acquires Paragon Bioservices (\$12Bn)
 - Thermo Fisher acquires Brammer Bio (\$1.7Bn)
 - Roche tries to acquire Spark Therapeutics (\$4.8Bn)
 - Biogen acquires Nightstar Therapeutics (\$800M)
 - BMS acquires Celgene (\$74Bn)
- IPOs in 2018/19
 - Avro Bio
 - Orchard Therapeutics
 - MeiraGTx
 - Autolus
- Private financing



The ATMP Manufacturing Community



- www.atmpmanufacture.org
- Amc aim is to provide critical mass and share best practice in manufacturing of cell and gene therapies in the UK
- Formed in 2010 and incorporated in 2015
- Runs 2 technical meetings/yr in different locations
- 19th meeting is in Dublin 10th October – registration open
- Informal, discussive, community feel



Lucy



Michael



Emily



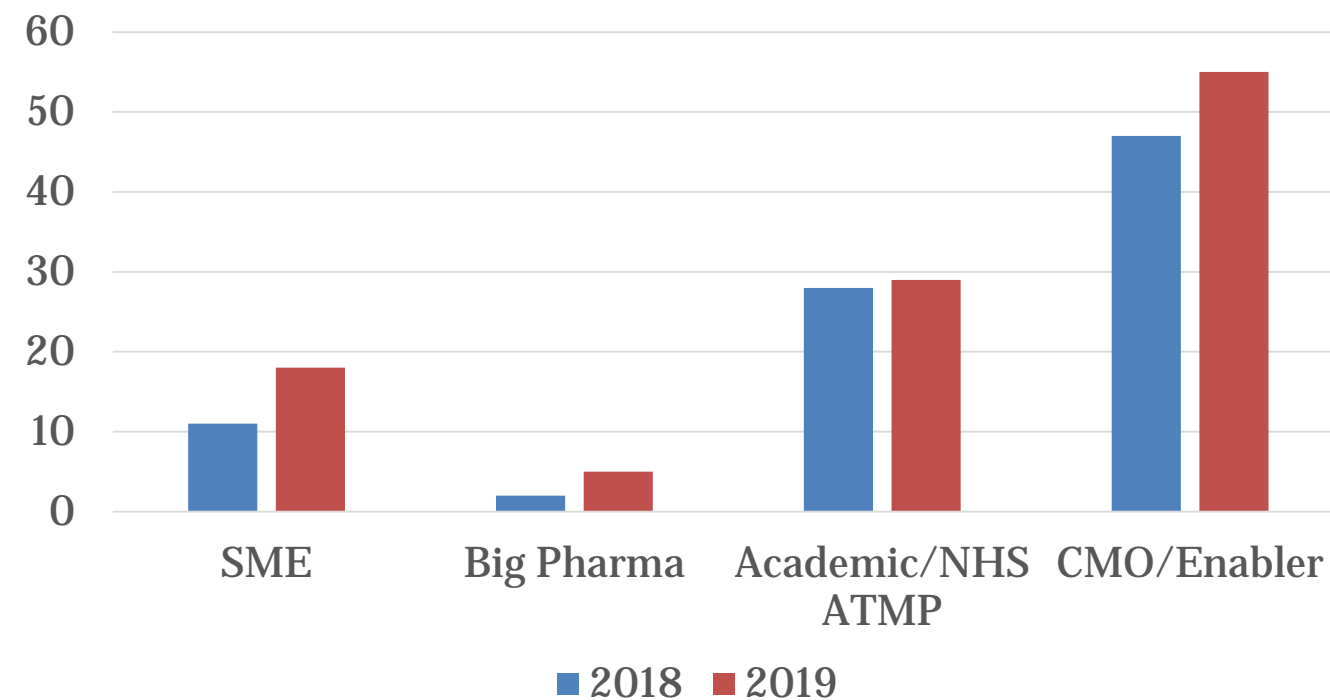
Angela

The Team!

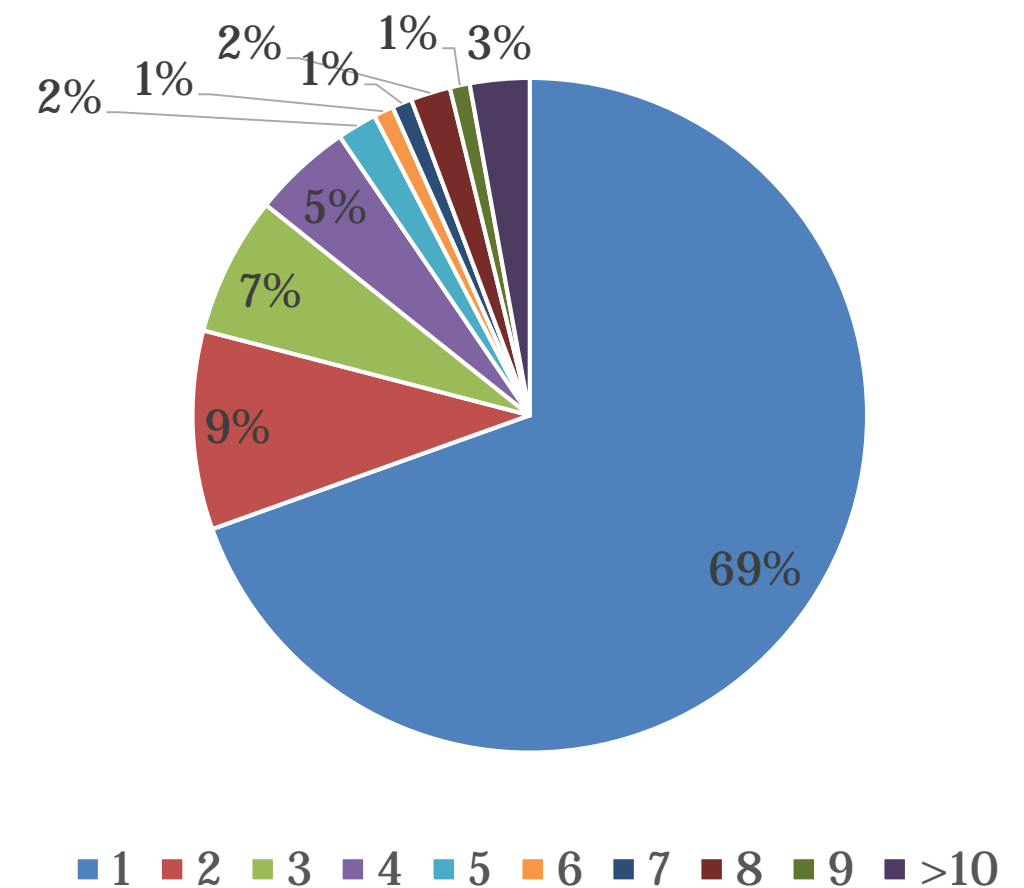


Mailing list = 760 (~668 in 2018)
Amc members = 226 (180 in 2018)

Type of Organisation



No. Members per Organisation





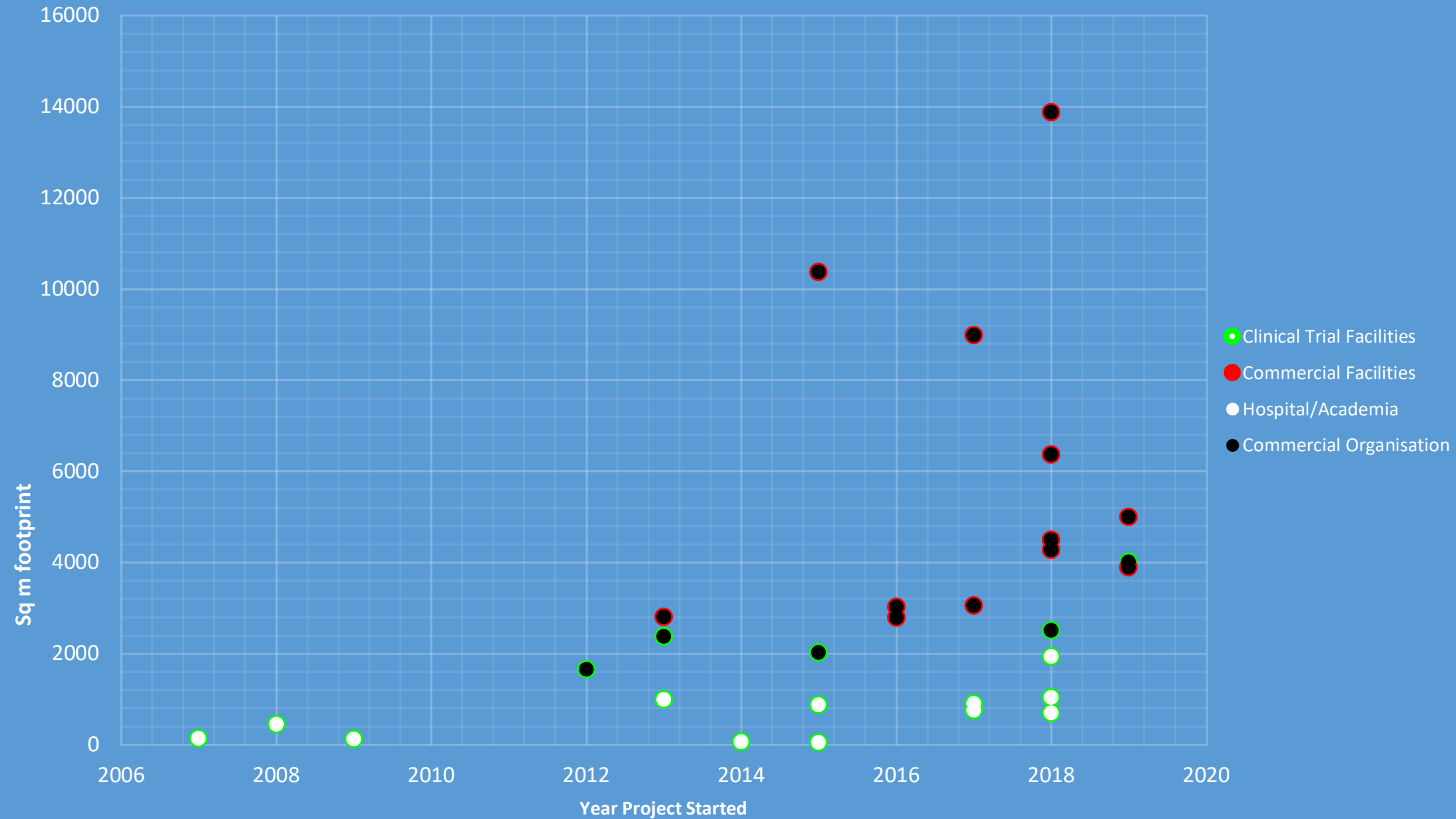
General
 Regs/Compliance
 Tools/technologies
 Supply chain
 Scale up/out



Time slot	Talk Title	Company	Speaker
0900	Registration (tea/coffee)		
1000	Amc update inc AGM and Atomic	amc	Angela Osborne
1015	Takeda's Cell Therapy Program & Project	Takeda	Benjamin Gysi
1030	Non-viral <i>Ex vivo</i> Cell engineering platform - Solupore®	Avectas	Shirley O'Dea
1045	The Robotic AUTOSTEM Platform For GMP-Compliant Manufacture of Bone Marrow-Derived Mesenchymal Stromal Cells	NUI Galway	Mary Murphy
1100	tbc	CCMI	Aoife Duffey
1115	ATMPs and Ireland	IDA	Invited
1130	Break (tea/coffee)		
1200	Scale-out of autologous cell therapies - Cocoon	Lonza	tbc
1230	Challenges of viral vector manufacture moving from 20L – 2000L	Oxford Biomedica	Invited
1300	streamlining the certification process; eBMR and eQP	Autonomous	Mark Lowdell
1330	Lunch (inc tea/coffee afterwards)		
1430	Equipment Update	Pall	tbc
1445	Analytics: burden of proof; automation	CGTC	Damian Marshall
1515	Lessons learnt from blood processing	NHSBT	Becky Ventre
1545	Break (tea/coffee)		
1615	Fresh Thoughts 1	ReNeuron	Zara Waheed
1630	Fresh Thoughts 2	Takeda	John Walker
1645	Panel Discussion (speakers Q&A)		
1715	Close and Dinner		



Manufacturing Challenges



Source:
eXmoor pharma



- For a gene modified cell therapy require:
 - Plasmid manufacture
 - Viral vector manufacturing
 - Cell drug product manufacture
- Outsource manufacture insufficient, expensive, slow, inflexible particularly for poorly developed processes
- Therapy developers are putting in their own capacity eg MeiraGTx and Karoo CGT



- Requirement to double number of people in ATMP manufacturing over next few years in all areas of manufacturing
- Initiatives in the UK:
 - ATOMIC for post graduate skills
 - ATAC for apprenticeships

atomi



for skills

advanced therapy manufacturing industry consortium

Aim:

to address the provision, development and retention of early career postgraduate and post doctoral scientists and engineers in ATMP manufacturing

- 9 founding members of Atomic
- 4 universities targeted in first year
- 2 Atomic meetings with students and consortium members/yr

Autolus

 Allergan™


OxfordBioMedica


eXmoor

CATAPULT
Cell and Gene Therapy

 PALL

 cpi

atomi
for skills

cobra:bio

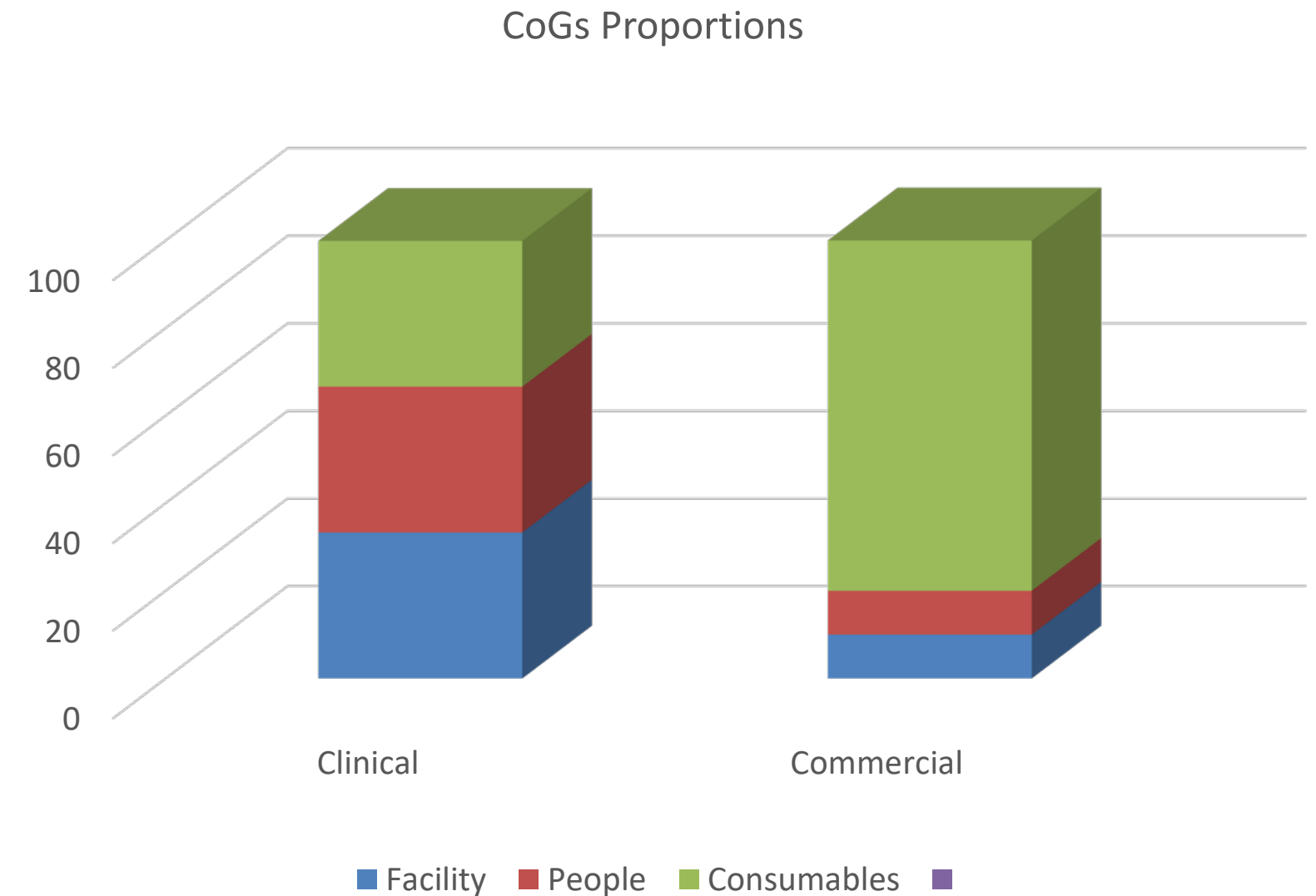
NHS
Blood and Transplant



- Early equipment “borrowed” from biopharma or medical devices; not a good fit
- New automated technologies evolving reducing risk and improving robustness and throughput
- Big suppliers buying SMEs with good ideas
- Gene Editing, non viral gene delivery, microfluidics
- Supply Chain “lumpy”, restrictive and expensive
- Suppliers unsure when market will grow and reluctant to fully invest ahead of this
- Process development to implement closed, robust, automated, integrated, GMP compliant, platform processes



- **Clinical manufacture**
 - Low throughput
 - Manual
 - High risk
- **Commercial manufacture**
 - High throughput
 - Automated
 - Low risk





What's Next?



- More of the same:
 - Continued growth
 - Continued funding
 - More products registered
 - More patients provided with life saving and enhancing treatments
- Join amc as a member!
- See us in Dublin on 10th October!
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